



Presented by  
Mr. Alex. Stewart, Guelph, Ont.  
July 24, 1941.























# YEAR BOOK

OF THE

# AMERICAN PHARMACEUTICAL ASSOCIATION

1913

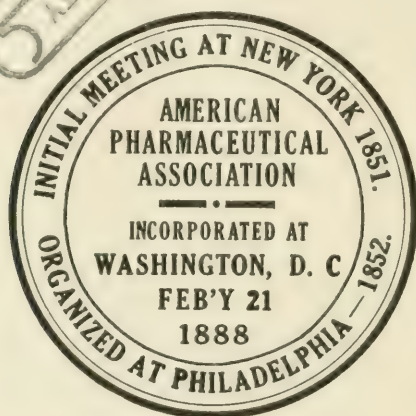
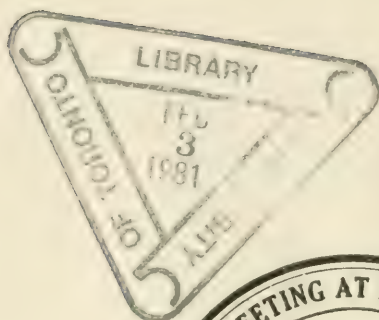
Vol. 2

CONTAINING THE FIFTY-SIXTH ANNUAL REPORT  
ON THE PROGRESS OF PHARMACY, AND  
THE CONSTITUTION, BY-LAWS  
AND ROLL OF MEMBERS

CORRESPONDING TO VOLUME SIXTY-ONE OF THE  
FORMER PROCEEDINGS OF THE  
AMERICAN PHARMACEUTICAL ASSOCIATION

CHICAGO, ILL.

Published by the  
AMERICAN PHARMACEUTICAL ASSOCIATION  
1915



# LIST OF OFFICERS OF THE ASSOCIATION SINCE ITS ORGANIZATION (NAMES OF DECEASED OFFICERS IN ITALICS)

Date.	Place of Meeting.	Presidents.	First Vice-Presidents.	Second Vice-Presidents.	Third Vice-Presidents.
Oct. 6, 1852	Philadelphia, Pa. ....	<i>Daniel B. Smith</i> , Philadelphia.	<i>George W. Andrews</i> , Baltimore.	<i>Samuel M. Colcord</i> , Boston.	<i>C. Augustus Smith</i> , Cincinnati.
Aug. 24, 1853	Boston, Mass. ....	<i>William A. Brewer</i> , Boston.	<i>George D. Coggeshall</i> , New York.	<i>Alexander Dugal</i> , Richmond, Va.	<i>Charles B. Guthrie</i> , Memphis, Tenn.
July 25, 1854	Cincinnati, O. ....	<i>William B. Chapman</i> , Cincinnati.	<i>Henry T. Cummings</i> , Portland, Me.	<i>John Meukim</i> , New York.	<i>Joseph Laidley</i> , Richmond, Va.
Sept. 11, 1855	New York, N. Y. ....	<i>John Meukim</i> , New York.	<i>Charles B. Guthrie</i> , Memphis, Tenn.	<i>Charles Ellis</i> , Philadelphia.	<i>Henry F. Fish</i> , Waterbury, Conn.
Sept. 9, 1856	Baltimore, Md. ....	<i>George W. Andrews</i> , Baltimore.	<i>John I. Kidwell</i> , Washington, D. C.	<i>Frederick Stearns</i> , Detroit, Mich.	<i>Henry T. Kiersted</i> , New York.
Sept. 8, 1857	Philadelphia, Pa. ....	<i>Charles Ellis</i> , Philadelphia.	<i>James Cooke</i> , Fredericksburg, Va.	<i>Samuel P. Peck</i> , Bennington, Vt.	<i>A. E. Richards</i> , Plaquemine, La.
Sept. 14, 1858	Washington, D. C. ....	<i>John I. Kidwell</i> , Georgetown, D. C.	<i>Edward R. Squibb</i> , Brooklyn, N. Y.	<i>James O'Gallagher</i> , St. Louis.	<i>Robert Batten</i> , Rome, Ga.
Sept. 13, 1859	Boston, Mass. ....	<i>Samuel M. Colcord</i> , Boston.	<i>William Procter, Jr.</i> , Philadelphia.	<i>Joseph Roberts</i> , Baltimore.	<i>Edwin O. Gale</i> , Chicago.
Sept. 11, 1860	New York, N. Y. ....	<i>Henry T. Kiersted</i> , New York.	<i>William J. M. Gordon</i> , Cincinnati.	<i>William S. Thompson</i> , Baltimore.	<i>Theodore Metcalf</i> , Boston.
Aug. 27, 1862	Philadelphia, Pa. ....	<i>Wm. Procter, Jr.</i> , Philadelphia.	<i>John Milhan</i> , New York.	<i>Eugene L. Massol</i> , St. Louis.	<i>J. Faris Moore</i> , Baltimore.
Sept. 8, 1863	Baltimore, Md. ....	<i>J. Faris Moore</i> , Baltimore.	<i>John M. Maisch</i> , Philadelphia.	<i>Chas. A. Tufis</i> , Dover, N. H.	<i>George W. Weyman</i> , Pittsburgh.
Sept. 21, 1864	Cincinnati, O. ....	<i>William J. M. Gordon</i> , Cincinnati.	<i>Richard H. Stabler</i> , Alexandria.	<i>Enno Sander</i> , St. Louis.	<i>Thomas Hollis</i> , Boston.

## LIST OF OFFICERS (Continued)

Date.	Place of Meeting.	Presidents.	First Vice Presidents.	Second Vice Presidents.	Third Vice Presidents.
Sept. 5, 1865	Boston, Mass.	<i>Henry W. Lincoln</i> , Boston.	<i>George C. Close</i> , Brooklyn, N. Y.	<i>Elijah W. Sackrider</i> , Cleveland, O.	<i>Charles A. Hemmish</i> , Lancaster, Pa.
Aug. 22, 1866	Detroit, Mich.	<i>Frederick Stearns</i> , Detroit, Mich.	<i>Edward Parrish</i> , Philadelphia.	<i>Ezekiel H. Sargent</i> , Chicago.	<i>John W. Shelden</i> , New York.
Sept. 10, 1867	New York, N. Y.	<i>John Milbau</i> , New York.	<i>Robert J. Brown</i> , Leavenworth, Kans.	<i>N. Hayson Jennings</i> , Baltimore.	<i>Daniel Henchman</i> , Boston.
Sept. 8, 1868	Philadelphia, Pa.	<i>Edward Parrish</i> , Philadelphia.	<i>Ferris Brighurst</i> , Wilmington, Del.	<i>Edward S. Wayne</i> , Cincinnati.	<i>Albert E. Ebert</i> , Chicago.
Sept. 7, 1869	Chicago, Ill.	<i>Ezekiel H. Sargent</i> , Chicago.	<i>Ferdinand W. Semm- wald</i> , St. Louis.	<i>John H. Pope</i> , New Orleans.	<i>Joel S. Orin</i> , Cambridgeport, Mass.
Sept. 13, 1870	Baltimore, Md.	<i>Richard H. Stabler</i> , Alexandria, Va.	<i>Fleming G. Grieve</i> , Milledgeville, Ga.	<i>James G. Steele</i> , San Francisco.	<i>Eugene L. Massol</i> , St. Louis.
Sept. 12, 1871	St. Louis, Mo.	<i>Enno Sander</i> , St. Louis.	<i>C. Lewis Diehl</i> , Louisville, Ky.	<i>George F. H. Markoe</i> , Boston.	<i>Matthae F. Ash</i> , Jackson, Miss.
Sept. 3, 1872	Cleveland, O.	<i>Albert E. Ebert</i> , Chicago.	<i>Samuel S. Garrigues</i> , East Saginaw, Mich.	<i>Edward P. Nichols</i> , Newark, N. J.	<i>Henry C. Gaylord</i> , Cleveland, O.
Sept. 16, 1873	Richmond, Va.	<i>John F. Hancock</i> , Baltimore.	<i>William Saunders</i> , London, Ont.	<i>John T. Buck</i> , Jackson, Miss.	<i>Paul Balluff</i> , New York.
Sept. 8, 1874	Louisville, Ky.	<i>C. Lewis Diehl</i> , Louisville, Ky.	<i>Joseph Roberts</i> , Baltimore.	<i>William T. Wenzell</i> , San Francisco.	<i>Augustus R. Bayley</i> , Cambridgeport, Mass.
Sept. 7, 1875	Boston, Mass.	<i>George F. H. Markoe</i> , Boston.	<i>Frederick Hoffmann</i> , New York.	<i>T. Roberts Baker</i> , Richmond, Va.	<i>Christian F. G. Meyer</i> , St. Louis.
Sept. 12, 1876	Philadelphia, Pa.	<i>Charles Bullock</i> , Philadelphia.	<i>Samuel A. D. Shep- pard</i> , Boston.	<i>Gustavus J. Luhn</i> , Charleston, S. C.	<i>Jacob D. Wells</i> , Cincinnati.

## LIST OF OFFICERS (Continued)

Date.	Place of Meeting.	Presidents.	First Vice-Presidents.	Second Vice-Presidents.	Third Vice-Presidents.
Sept. 4, 1877	Toronto, Can.....	<i>William Saunders</i> , London, Ont.	<i>Eugen McIntyre</i> , New York.	<i>John Ingalls</i> , Macon, Ga.	<i>Emlen Painter</i> , San Francisco.
Nov. 26, 1878	Atlanta, Ga.....	<i>Gustavus J. Luhn</i> , Charleston, S. C.	<i>Fredrick T. Whiting</i> , Great Barrington, Mass.	<i>Henry J. Rose</i> , Toronto, Can.	<i>William H. Crawford</i> , St. Louis.
Sept. 9, 1879	Indianapolis, Ind.....	<i>George W. Sloan</i> , Indianapolis, Ind.	<i>T. Roberts Baker</i> , Richmond, Va.	<i>Joseph L. Lemberger</i> , Lebanon, Pa.	<i>Philip C. Candidus</i> , Mobile, Ala.
Sept. 14, 1880	Saratoga, N. Y.....	<i>James T. Shinn</i> , Philadelphia.	<i>George H. Schafer</i> , Fort Madison, Ia.	<i>William S. Thompson</i> , Washington, D. C.	<i>William Simpson</i> , Raleigh, N. C.
Aug. 23, 1881	Kansas City, Mo.....	<i>P. Wendover Bedford</i> , New York.	<i>Emlen Painter</i> , San Francisco.	<i>George Leis</i> , Lawrence, Kans.	<i>John F. Judge</i> , Cincinnati.
Sept. 12, 1882	Niagara Falls, N. Y.....	<i>Charles A. Heinitsch</i> , Lancaster, Pa.	<i>John Ingalls</i> , Macon, Ga.	<i>Louis Dolme</i> , Baltimore.	<i>William B. Blanding</i> , Providence, R. I.
Sept. 11, 1883	Washington, D. C.....	<i>William S. Thompson</i> , Washington, D. C.	<i>Charles Rice</i> , New York.	<i>Fredrick H. Masi</i> , Norfolk, Va.	<i>Edward W. Runyon</i> , San Francisco.
Aug. 26, 1884	Milwaukee, Wis.....	<i>John Ingalls</i> , Macon, Ga.	<i>John A. Dodd</i> , Milwaukee, Wis.	<i>Henry Canning</i> , Boston.	<i>Charles F. Gootman</i> , Omaha, Neb.
Sept. 8, 1885	Pittsburg, Pa.....	<i>Joseph Roberts</i> , Baltimore.	<i>Albert H. Hollister</i> , Madison, Wis.	<i>Albert B. Prescott</i> , Ann Arbor, Mich.	<i>Joseph S. Evans</i> , West Chester, Pa.
Sept. 7, 1886	Providence, R. I.....	<i>Chas. A. Tuffs</i> , Dover, N. H.	<i>Henry J. Menninger</i> , Brooklyn, N. Y.	<i>M. W. Alexander</i> , St. Louis.	<i>Norman A. Kuhn</i> , Omaha, Neb.
Sept. 5, 1887	Cincinnati, O.....	<i>John U. Lloyd</i> , Cincinnati.	<i>M. W. Alexander</i> , St. Louis.	<i>A. K. Findlay</i> , New Orleans.	<i>Karl Simmon</i> , St. Paul, Minn.
Sept. 3, 1888	Detroit, Mich.....	<i>M. W. Alexander</i> , St. Louis.	<i>Jas. Vernor</i> , Detroit, Mich.	<i>Fred Willcox</i> , Waterbury, Conn.	<i>Alvan A. Yeager</i> , Knoxville, Tenn.



## LIST OF OFFICERS (Continued)

Date	Place of Meeting.	Presidents.	First Vice-Presidents.	Second Vice-Presidents.	Third Vice-Presidents
June 24, 1889	San Francisco, Cal.	<i>Emden Painter</i> , New York.	Karl Simmon, St. Paul, Minn.	<i>Wm. M. Seabury</i> , San Francisco.	Joseph W. Eckford, Aberdeen, Miss.
Sept. 8, 1890	Old Pt. Comfort, Va.	<i>J. B. Taylor</i> , Philadelphia.	A. B. Stevens, Ann Arbor, Mich.	<i>Chas. E. Dohme</i> , Baltimore.	Jas. M. Good, St. Louis.
April 27, 1891	New Orleans, La.	<i>J. K. Finley</i> , New Orleans.	<i>Geo. J. Seabury</i> , New York.	W. H. Torbert, Dubuque, Ia.	L. T. Dunning, Sioux Falls, S. Dak.
July 14, 1892	Profile House, N. H.	Jos. P. Remington, Philadelphia.	A. P. Preston, Portsmouth, N. H.	<i>Sidney P. Watson</i> , Atlanta, Ga.	<i>Wm. H. Averill</i> , Frankfort, Ky.
Aug. 14, 1893	Chicago, Ill.	Edgar L. Patch, Boston.	<i>Leo Eliel</i> , South Bend, Ind.	Wiley Rogers, Louisville, Ky.	Chas. Caspari, Jr., Baltimore.
Sept. 3, 1894	Asheville, N. C.	<i>William Simpson</i> , Raleigh, N. C.	Chas. M. Ford, Denver, Col.	Jno. N. Hurty, Indianapolis, Ind.	<i>Jas. E. Morrison</i> , Montreal, Can.
Aug. 14, 1895	Denver, Col.	James M. Good, St. Louis.	<i>Chas. E. Dohme</i> , Baltimore.	Adolph Brandenburger, Jefferson City, Mo.	Mrs. M. O. Miner, Hiawatha, Kan.
Aug. 12, 1896	Montreal, Can.	<i>Joseph E. Morrison</i> , Montreal, Can.	Geo. F. Payne, Atlanta, Ga.	Wm. A. Frost, St. Paul, Minn.	Geo. W. Parison, Perth Amboy, N. J.
Aug. 23, 1897	Lake Minnetonka, Minn.	<i>Henry M. Whitney</i> , Lawrence, Mass.	George C. Bartells, Camp Point, Ill.	<i>Wm. S. Thompson</i> , Washington, D. C.	<i>Jacob A. Miller</i> , Harrisburg, Pa.
Aug. 29, 1898	Baltimore, Md.	<i>Charles E. Dohme</i> , Baltimore.	George F. Payne, Atlanta, Ga.	James H. Beal, Scio, O.	Miss Josie A. Wanoos, Minneapolis, Minn.
Sept. 4, 1899	Put-in-Bay, O.	<i>Albert B. Prescott</i> , Ann Arbor, Mich.	Lewis C. Hopp, Cleveland, O.	Wm. L. Dewoody, Pine Bluff, Ark.	Henry R. Gray, Montreal, Can.
May 7, 1900	Richmond, Va.	Jno. F. Patton, York, Pa.	James H. Beal, Scio, O.	Jno. W. Gayle, Frankfort, Ky.	E. A. Ruddiman, Nashville, Tenn.
Sept. 16, 1901	St. Louis, Mo.	Henry M. Whelpley, St. Louis.	<i>Wm. M. Seabury</i> , San Francisco.	George F. Payne, Atlanta, Ga.	<i>Wm. S. Thompson</i> , Washington, D. C.

## LIST OF OFFICERS (Concluded)

Date.	Place of Meeting.	Presidents.	First Vice-Presidents.	Second Vice-Presidents.	Third Vice-Presidents.
Sept. 8, 1902	Philadelphia, Pa. ....	Geo. F. Payne, Atlanta, Ga.	Wm. L. Cliffe, Philadelphia, Pa.	Eugene G. Eberle, Dallas, Texas.	Henry Willis, Quebec, Can.
Aug. 3, 1903	Mackinac Island, Mich. ....	Lewis C. Hopp, Cleveland, O.	Wm. C. Alpers, New York.	Albert M. Roehrig, Stapleton, N. Y.	Otto F. Claus, St. Louis, Mo.
Sept. 5, 1904	Kansas City, Mo. ....	James H. Beal, Scio, O.	<i>Philip C. Candidus</i> , Mobile, Ala.	Wm. Mittelbach, Boonville, Mo.	Julius A. Koch, Pittsburg, Pa.
Sept. 4, 1905	Atlantic City, N. J. . . .	Jos. L. Lemberger, Lebanon, Pa.	Chas. Holzhauer, Newark, N. J.	Chas. A. Rapelye, Hartford, Conn.	Flavius C. Godbold, New Orleans, La.
Sept. 3, 1906	Indianapolis, Ind. ....	<i>Leo Elliot</i> , South Bend, Ind.	Wm. Mittelbach, Boonville, Mo.	<i>C. S. N. Hallberg</i> , Chicago, Ill.	<i>Thomas P. Cook</i> , New York, N. Y.
Sept. 2, 1907	New York, N. Y. ....	<i>Wm. M. Scarby</i> , San Francisco, Cal.	<i>Oscar Oldberg</i> , Chicago, Ill.	Henry H. Rusby, New York, N. Y.	Oscar W. Bethen, Meridian, Miss.
Sept. 7, 1908	Hot Springs, Ark. ....	<i>Oscar Oldberg</i> , Chicago, Ill.	Eugene G. Eberle, Dallas, Texas.	Wm. Mittelbach, Boonville, Mo.	James H. Beal, Scio, O.
Aug. 16, 1909	Los Angeles, Cal.	Henry H. Rusby, Newark, N. J.	Clement B. Lowe, Philadelphia, Pa.	Chas. W. Johnson, Seattle, Wash.	Wm. B. Day, Chicago, Ill.
May 2, 1910	Richmond, Va. ....	Eugene G. Eberle, Dallas, Texas.	Wm. B. Day, Chicago, Ill.	Otto F. Claus, St. Louis, Mo.	Leonard A. Seltzer, Detroit, Mich.
Aug. 14, 1911	Boston, Mass. ....	John G. Godding, Boston, Mass.	W. Bodemann, Chicago, Ill.	Chas. M. Ford, Denver, Col.	Ernest Berger, Tampa, Fla.
Aug. 19, 1912	Denver, Col. ....	William B. Day, Chicago, Ill.	Chas. M. Ford, Denver, Col.	Caswell A. Mayo, New York, N. Y.	C. Herbert Packard, East Boston, Mass.
Aug. 18, 1913	Nashville, Tenn. ....	George M. Beringer, Camden, N. J.	Franklin M. Apple, Philadelphia, Pa.	Wm. S. Richardson, Washington, D. C.	L. D. Havenhill, Lawrence, Kan.

## HONORARY PRESIDENTS.

*Philip C. Candlish*, Mobile, Ala., 1907-08.  
*Samuel A. D. Sheppard*, Boston, Mass.,  
 1908-09.

*Eme Sundler*, St. Louis, Mo., 1909-10.

*Alfred B. Taylor*, Philadelphia, 1852-54.  
*Samuel M. Child*, Boston, 1854-55, and  
 1857-59.  
*James S. Aspinwall*, New York, 1856-57.

*Essex McIntyre*, New York, N. Y., 1910-11.  
*Henry Birch*, Chicago, Ill., 1911-12.  
*Thomas F. Main*, New York, N. Y., 1912-13.

Albert B. Lyons, Detroit, Mich., 1913-14.

## TREASURERS.

*Alshel Boyden*, Boston, 1859-60.  
*Henry Hasland*, New York, 1860-63.  
*J. Brown Baxley*, Baltimore, Md., 1863-65.  
*Charles A. Telfs*, Dover, N. H., 1865-86.

*Samuel A. D. Sheppard*, Boston, 1886-1908.  
*Henry M. Whippley*, St. Louis, 1908-14.

## RECORDING SECRETARIES.

*George D. Coggeshall*, New York, 1852-53.  
*Edward Parrish*, Philadelphia, 1853-54.  
*Edvard S. Wayne*, Cincinnati, 1854-55.

*William J. M. Gordon*, Cincinnati, 1855-59.  
*Charles Bullock*, Philadelphia, 1859-60.  
*James T. Shinn*, Philadelphia, 1860-62.

*Peter W. Bedford*, New York, 1862-63.  
*William Evans, Jr.*, Philadelphia, 1863-64.  
*Henry N. Rittenhouse*, Philadelphia,  
 1864-65.

## CORRESPONDING SECRETARIES.

*William Procter, Jr.*, Philadelphia, 1852-53  
 and 1854-57.  
*William B. Chapman*, Cincinnati, 1853-54.  
*Edvard Parrish*, Philadelphia, 1857-58.

*John M. Maisch*, Philadelphia, 1862-63.

## PERMANENT SECRETARIES.

*John M. Maisch*, Philadelphia, 1865-Sept., 1893.  
*Henry M. Whippley*, St. Louis (acting), August, 1893.

*Joseph P. Kemington*, Philadelphia, 1893-94.  
*Chas. Caspari, Jr.*, Baltimore, 1894-96.

## GENERAL SECRETARIES.

*Chas. Caspari, Jr.*, Baltimore, 1896-1911.

*James H. Beal*, Scio, Ohio, 1911-14.

## LOCAL SECRETARIES.

For the meeting  
held in

1867 . . .	<i>P. Wendover Bedford.</i>
1868 . . .	<i>Alfred B. Taylor.</i>
1869 . . .	<i>Henry W. Fuller.</i>
1870 . . .	<i>J. Farris Moore.</i>
1871 . . .	<i>William H. Cruteford.</i>
1872 . . .	<i>Henry C. Gaylord.</i>
1873 . . .	<i>Thomas H. Hazard.</i>
1874 . . .	<i>Emil Scheffer.</i>
1875 . . .	<i>Samuel A. D. Sheppard.</i>
1876 . . .	<i>Adolphus W. Miller.</i>
1877 . . .	<i>Henry J. Rose.</i>
1878 . . .	<i>Jesse W. Rankin.</i>
1879 . . .	<i>Eli Lilly.</i>
1880 . . .	<i>Charles F. Fish.</i>
1881 . . .	<i>William T. Ford.</i>
1882 . . .	<i>Hiram E. Griffith.</i>

For the meeting  
held in

1883 . . .	<i>Charles Becker.</i>
1884 . . .	<i>Henry C. Schranck.</i>
1885 . . .	<i>George A. Kelly.</i>
1886 . . .	<i>William B. Blanding.</i>
1887 . . .	<i>George W. Foss.</i>
1888 . . .	<i>James Verror.</i>
1889 . . .	<i>Edward W. Runyon.</i>
1890 . . .	<i>Charles E. Dolme.</i>
1891 . . .	<i>A. K. Finlay.</i>
1892 . . .	<i>H. M. Whitney.</i>
1893 . . .	<i>Henry Biroth.</i>
1894 . . .	<i>W. G. Smith.</i>
1895 . . .	<i>Edm. L. Scholtz.</i>
1896 . . .	<i>Joseph E. Morrison.</i>
1897 . . .	<i>Edw. Shumpik.</i>
1898 . . .	<i>Henry P. Hynson.</i>

For the meeting  
held in

1899 . . .	<i>Lewis C. Hopp.</i>
1900 . . .	<i>T. Ashby Miller.</i>
1901 . . .	<i>H. M. Whelpley.</i>
1902 . . .	<i>William L. Cliffe.</i>
1903 . . .	<i>F. W. R. Perry.</i>
1904 . . .	<i>Joseph C. Wirthman.</i>
1905 . . .	<i>William C. Westcott.</i>
1906 . . .	<i>Frank H. Carter.</i>
1907 . . .	<i>Thomas P. Cook.</i>
1908 . . .	<i>Martin A. Eisele.</i>
1909 . . .	<i>Thomas W. Jones.</i>
1910 . . .	<i>T. Ashby Miller.</i>
1911 . . .	<i>C. Herbert Packard.</i>
1912 . . .	<i>Charles M. Ford.</i>
1913 . . .	<i>James O. Burge.</i>
1914 . . .	<i>Leonard A. Schizer.</i>

## REPORTERS ON PROGRESS OF PHARMACY.

C. L. Diehl, Louisville, Ky., 1873-91 and 1905-1914.	Chas. Rice, New York, N. Y., 1891-92.	Henry Kraemer, Philadelphia, Pa., 1892-95.
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## PAST AND PRESENT OFFICERS OF THE SECTIONS.

## SECTION ON COMMERCIAL INTERESTS.

## Chairman.

## Secretary.

1887-88 . . .	<i>A. H. Hallister.</i>
1888-89 . . .	<i>A. H. Hallister.</i>
1889-90 . . .	<i>Leo Elliot.</i>
1900-91 . . .	<i>Henry Canning.</i>

## Chairman.

## Secretary.

1891-92 . . .	<i>W. H. Tobert.</i>
1892-93 . . .	<i>W. H. Tobert.</i>
1893-94 . . .	<i>Wiley Rogers.</i>
1894-95 . . .	<i>Geo. J. Seabury.</i>
1895-96 . . .	<i>Geo. J. Seabury.</i>

## Secretary.

Arthur Bassett
Arthur Bassett
Jas. O. Burge.
Jas. O. Burge
Clay W. Holmes

## PAST AND PRESENT OFFICERS OF THE SECTIONS (Continued).

<i>Chairman.</i>		<i>Secretary.</i>	
1896-97	Lewis C. Hoop.	1894-95	A. R. L. Dohme.
1897-98	Joseph Jacobs.	1895-96	S. P. Sadler.
1898-99	Joseph Jacobs.	1896-97	W. C. Alpers.
1899-00	James M. Good.	1897-98	Edward Kremers.
1900-01	Charles A. Rapelye.	1898-99	Henry H. Rusby.
1901-02	F. W. Meissner.	1899-00	Frank G. Ryan.
1902-03	Thomas V. Wooten.	1900-01	Oscar Oldberg.
1903-04	Wm. L. Dewoody.	1901-02	Lyman F. Kehler.
1904-05	Charles R. Sherman.	1902-03	J. O. Schlatterbeck.
1905-06	Henry P. Hynson.	1903-04	William A. Puckner.
1906-07	Herman D. Knisely.	1904-05	Eustace H. Gane.
1907-08	Jacob Diner.	1905-06	Charles E. Caspari.
1908-09	Harry B. Mason.	1906-07	Reid Hunt.
1909-10	Waldo M. Bowman.	1907-08	Virgil Coblentz.
1910-11	Franklin M. Apple.	1908-09	Charles E. Vanderkleed.
1911-12	Ernest Berger.	1909-10	Martin I. Wilbert.
1912-13	Autumn V. Pease.	1910-11	Albert H. Clark.
1913-14	C. G. Lindvall, and H. B. Mason	1911-12	W. O. Richtmann.
SECTION ON SCIENTIFIC PAPERS.		1912-13	Frank R. Eldred.
<i>Chairman.</i>		1913-14	Edsel A. Ruddiman.
<i>Secretary.</i>		SECTION ON PHARMACEUTICAL LEGISLATION.	
1887-88	T. Roberts Baker.	<i>Chairman.</i>	
1888-89	Emlen Parmer.	<i>Secretary.</i>	
1889-90	Henry Whelpley.	1887-88	R. F. Bryant.
1890-91	E. L. Patch.	1888-89	C. W. Day.
1891-92	C. S. N. Hallberg.	SECTION ON PHARMACEUTICAL EDUCATION.	
1892-93	C. T. P. Fennel.	<i>Chairman.</i>	
1893-94	L. E. Sayre.	<i>Secretary.</i>	
		1887-88	John F. Judge.
		1888-89	P. W. Bedford.
		<i>Secretary.</i>	
		1887-88	George B. Kauffman.
		1888-89	W. C. Alpers.
		1889-90	Virgil Coblentz.
		1890-91	A. B. Lyons.
		1891-92	H. V. Army.
		1892-93	Caswell A. Mayo.
		1893-94	Lyman F. Kehler.
		1894-95	Jos. W. England.
		1895-96	Jos. W. England.
		1896-97	Eustace H. Gane.
		1897-98	Charles E. Caspari.
		1898-99	Daniel Base.
		1899-00	Virgil Coblentz.
		1900-01	Chas. E. Vanderkleed.
		1901-02	Martin I. Wilbert.
		1902-03	Albert H. Clark.
		1903-04	Wm. O. Richtmann.
		1904-05	Charles H. Lawall.
		1905-06	Freeman P. Stroup.
		1906-07	Wilbur L. Scoville.



## PAST AND PRESENT OFFICERS OF THE SECTIONS (Continued).

SECTION ON PHARMACEUTICAL EDUCATION AND LEGISLATION.		SECTION ON PRACTICAL PHARMACY AND DISPENSING.	
Chairman.		Chairman.	
1889-90 . . . . .	P. W. Bedford.	1900-01 . . . . .	H. P. Hynson.
1890-91 . . . . .	William Simon.	1901-02 . . . . .	F. W. E. Stedem.
1891-92 . . . . .	A. B. Stevens.	1902-03 . . . . .	Geo. M. Beringer.
1892-93 . . . . .	R. G. Eccles.	1903-04 . . . . .	William H. Burke.
1893-94 . . . . .	R. G. Eccles.	1904-05 . . . . .	Charles A. Rapelye.
1894-95 . . . . .	James M. Good.	1905-06 . . . . .	Wm. C. Alpers.
1895-96 . . . . .	C. S. N. Hallberg.	1906-07 . . . . .	H. A. Brown Dunning.
1896-97 . . . . .	C. S. N. Hallberg.	1907-08 . . . . .	Franklin M. Apple.
1897-98 . . . . .	James H. Beal.	1908-09 . . . . .	Leonard A. Seltzer.
1898-99 . . . . .	A. B. Lyons.	1909-10 . . . . .	Otto Raubenheimer.
1899-00 . . . . .	C. B. Lowe.	1910-11 . . . . .	Louis Staalbach.
1900-01 . . . . .	C. B. Lowe.	1911-12 . . . . .	P. Henry Utech.
1901-02 . . . . .	E. G. Eberle.	1912-13 . . . . .	J. Leon Lascoff.
1902-03 . . . . .	J. W. T. Knox.	1913-14 . . . . .	F. W. Nitardy.
1903-04 . . . . .	Harry B. Mason.		
1904-05 . . . . .	Harry B. Mason.	SECTION ON HISTORICAL PHARMACY	
1905-06 . . . . .	Oscar Oldberg.	Chairman.	
1906-07 . . . . .	Oscar Oldberg.	1904-05 . . . . .	Albert E. Eberle.
1907-08 . . . . .	Jos. W. England.	1905-06 . . . . .	John F. Hancock.
1908-09 . . . . .	Jos. W. England.	1906-07 . . . . .	Eugen McIntyre.
1909-10 . . . . .	Charles H. LaWall.	1907-08 . . . . .	Edward V. Howell.
1910-11 . . . . .	Charles W. Johnson.	1908-09 . . . . .	John B. Bond.
1911-12 . . . . .	John C. Wallace.	1909-10 . . . . .	Eugene G. Eberle.
1912-13 . . . . .	Wilber J. Teeters.	1910-11 . . . . .	Joseph L. Lemberger.
1913-14 . . . . .	Hugh Craig.	1911-12 . . . . .	Otto Raubenheimer.
		1912-13 . . . . .	John G. Godding.
		1913-14 . . . . .	Wm. C. Alpers.
		SECTION ON HISTORICAL PHARMACY	
		Secretary.	
		1904-05 . . . . .	Caswell A. Mayo.
		1905-06 . . . . .	C. S. N. Hallberg.
		1906-07 . . . . .	Eugene G. Eberle.
		1907-08 . . . . .	Eugene G. Eberle.
		1908-09 . . . . .	Eugene G. Eberle.
		1909-10 . . . . .	John A. Dunn.
		1910-11 . . . . .	Otto Raubenheimer.
		1911-12 . . . . .	Caswell A. Mayo.
		1912-13 . . . . .	Frederick T. Gordon.
		1913-14 . . . . .	Frederick T. Gordon.

## SECTION ON PHARMACEUTICAL EDUCATION AND LEGISLATION.

## SECTION ON PRACTICAL PHARMACY AND DISPENSING.

## Secretary.

## Chairman.

## Secretary.

## Chairman.

## PAST AND PRESENT OFFICERS OF THE SECTIONS (Concluded).

SECTION ON PHARMACOPOEIAS AND FORMULARIES.		WOMEN'S SECTION.	
<i>Chairman.</i>	<i>Secretary.</i>	<i>Chairman.</i>	<i>Secretary.</i>
1912-13 . . . L. D. Havenhill.	E. Fullerton Cook.	1912-13, . . . Mrs. John G. Godding.	Miss Anna C. Bagley.
1913-14 . . . E. Fullerton Cook.	R. H. Needham.	1913-14, . . . Mrs. John G. Godding.	Miss Anna C. Bagley.

## OFFICERS OF THE COUNCIL SINCE ITS FIRST ORGANIZATION.

<i>Chairman.</i>	<i>Vice-Chairman.</i>	<i>Secretary.</i>
1880-81 . . . Jos. P. Remington.	<i>Joseph Roberts.</i>	<i>George W. Kennedy.</i>
1881-82 . . . " "	<i>Wm. J. M. Gordon.</i>	" "
1882-83 . . . " "	" "	" "
1883-84 . . . " "	<i>C. Lewis Diehl.</i>	" "
1884-85 . . . " "	<i>John A. Dadd.</i>	" "
1885-86 . . . " "	<i>C. Lewis Diehl.</i>	" "
1886-87 . . . Wm. S. Thompson.	<i>H. J. Menninger.</i>	" "
1887-88 . . . Wm. H. Rogers.	<i>Karl Simmon.</i>	" "
1888-89 . . . Jas. M. Good.	<i>Emile Painter.</i>	" "
1889-90 . . . " "	<i>Wm. S. Thompson.</i>	" "
1890-91 . . . " "	" "	" "
1891-92 . . . " "	" "	" "
1892-93 . . . " "	<i>H. M. Whitney.</i>	" "
1893-94 . . . " "	" "	" "

## OFFICERS OF THE COUNCIL SINCE ITS FIRST ORGANIZATION (Concluded).

	<i>Chairman.</i>	<i>Vice-Chairman.</i>	<i>Secretary.</i>
1894-95 . . . .	Wm. S. Thompson.	H. M. Whitney.	George W. Kennedy.
1895-96 . . . .	" " "	Wm. C. Alpers.	" " "
1896-97 . . . .	" " "	Jas. M. Good.	" " "
1897-98 . . . .	" " "	" " "	" " "
1898-99 . . . .	" " "	" " "	" " "
1899-00 . . . .	" " "	" " "	" " "
1900-01 . . . .	" " "	" " "	" " "
1901-02 . . . .	A. B. Prescott.	Chas. E. Dahme.	" " "
1902-03 . . . .	James H. Beal.	Lewis C. Hopp.	Henry M. Whelpley.
1903-04 . . . .	" " "	Leo Flid.	" " "
1904-05 . . . .	" " "	Jos. L. Lemberger.	" " "
1905-06 . . . .	" " "	Wm. C. Alpers.	" " "
1906-07 . . . .	" " "	Albert M. Roehrig.	" " "
1907-08 . . . .	" " "	" " "	" " "
1908-09 . . . .	Jos. P. Remington.	Wm. M. Starby.	Joseph W. England.
1909-10 . . . .	Fabius C. Godbold.	Julius A. Koch.	" " "
1910-11 . . . .	James H. Beal.	Henry H. Rusby.	" " "
1911-12 . . . .	Eugene G. Eberle.	James M. Good.	" " "
1912-13 . . . .	" " "	Fabius C. Godbold.	" " "
1913-14 . . . .	" " "	J. G. Godding.	" " "

# CONSTITUTION AND BY-LAWS

## OF THE

# American Pharmaceutical Association

(Revised to August 29, 1914, inclusive.)

## CONSTITUTION

**ARTICLE I.** This Association shall be called the "American Pharmaceutical Association." Its aim shall be to unite the educated and reputable Pharmacists and Druggists of America in the following objects:

1. To improve and regulate the drug market by preventing the importation of inferior, adulterated, or deteriorated drugs and by detecting and exposing home adulterations.

2. To encourage such proper relations among Druggists, Pharmacists, Physicians and the people at large, as may promote the public welfare, and tend to mutual strength and advantage.

3. To improve the science and art of Pharmacy by diffusing scientific knowledge among Apothecaries and Druggists, fostering pharmaceutical literature, developing talent, stimulating discovery and invention, and encouraging home production and manufacture in the several departments of the drug business.

4. To regulate the system of apprenticeship and employment, so as to prevent, as far as practicable, the evils flowing from deficient training in the responsible duties of preparing, dispensing and selling medicines.

5. To suppress empiricism, and to restrict the dispensing and sale of medicines to regularly educated Druggists and Apothecaries.

6. To uphold standards of authority in the Education, Theory and Practice of Pharmacy.

7. To create and maintain a standard of professional honesty equal to the amount of our professional knowledge with a view to the highest good and greatest protection to the public.

**ARTICLE II.** This Association shall consist of active, life, and honorary members, and shall hold its meetings annually.

**ARTICLE III.** The officers of the Association shall be a President, three Vice-Presidents, a General Secretary, a Treasurer, and a Reporter on the Progress of Pharmacy, all of whom shall be elected annually; also a Local Secretary to be elected by the Council. They shall hold office until an election of successors.

**ARTICLE IV.** All moneys received from life membership, together with such funds as may be bequeathed, or otherwise donated to the Association, may be invested by the Treasurer in United States Government, State, Municipal, County or other securities acceptable as security for postal savings deposits, the interest of which for any current year only may be used by the Association for its expenses.

ARTICLE V. Every proposition to alter or amend this Constitution shall be printed in the Journal at least thirty days prior to the annual meeting; shall be read at the first general session of the annual meeting, and shall be balloted upon at a subsequent general session, when, upon receiving the affirmative votes of two-thirds of the members present, it shall become a part of the Constitution. Any proposition to amend the Constitution for the purpose of permitting the expenditure of the permanent invested funds of the Association, shall require a majority of seven-eighths for its passage.

## BY-LAWS

### CHAPTER I.

#### *Of the Election of Officers.*

ARTICLE I. A Nominating Committee shall be annually chosen, whose duty it shall be annually, at the meeting, to select candidates for the offices of President, three Vice-Presidents and three members of the Council.

ARTICLE II. The Nominating Committee shall submit the names of three persons as candidates for each of the offices of President, First Vice-President, Second Vice-President, Third Vice-President, and three members of the Council. These names are to be submitted by the General Secretary by mail to every member of the Association, together with a request that the member indicate his preference on a ballot enclosed for that purpose, and return the same by mail within one month after the adjournment of the annual meeting.

ARTICLE III. The ballots received as indicated in the preceding article are to be sent by the General Secretary to a Board of Canvassers, composed of three members to be appointed by the President, who shall count as votes in the annual election only the votes of those members whose dues have been paid for the current year, and who in turn shall certify to the General Secretary the result of the election, after which the latter shall be published in the JOURNAL of the Association.

ARTICLE IV. The officers thus elected by a plurality of the votes cast shall be installed at the final general session of the next annual meeting.

ARTICLE V. The Honorary President, Reporter on the Progress of Pharmacy, the Treasurer and the General Secretary shall be elected annually by the Council.

### CHAPTER II.

#### *Of the President and Vice-Presidents.*

ARTICLE I. The President shall preside at all general sessions of the Association, except those of the special Sections, as hereinafter provided. In the event of his absence or inability to serve, one of the Vice-Presidents, or in the absence of all, a President *pro tempore*, shall perform the duties of the President.

ARTICLE II. In the absence of the General Secretary, the President shall appoint a Recording Secretary *pro tempore*.

ARTICLE III. At the sessions the President shall take the chair at the proper time; announce all business; receive all proper motions, resolutions, reports and communications, and order the vote upon all proper questions at the proper time.



ARTICLE IV. In all balloting, and on questions upon which the ayes and nays are taken, the President is required to vote, but his name shall be called last; in other cases he shall not vote, unless the members be equally divided, or unless his vote, if given to the minority, will make the decision equal; and in case of such equal division, the motion is lost.

ARTICLE V. He shall enforce order and decorum; it is his duty to hear all that is spoken in debate, and in case of personality and impropriety he shall promptly call the speaker to order. He shall decide all questions of order, subject to the right of appeal, unless in case where he prefers to submit the matter to the members; decide promptly who is to speak when two or more members rise at the same moment, and be careful to see that business is brought forward in proper order.

ARTICLE VI. He shall have the right to call a member to the chair, in order that he may take the floor in debate. He shall see that the Constitution and By-Laws are properly enforced.

ARTICLE VII. He shall appoint all committees, not provided for in the By-Laws or otherwise directed by the Association.

ARTICLE VIII. He shall sign the certificates of membership, and countersign all orders on the Treasury. He shall obey the instructions of the Association, and authenticate by his signature, when necessary, its proceedings.

ARTICLE IX. He shall present at each annual meeting an address, embodying general scientific facts and events of the year, or discuss such scientific questions as may to him seem suitable to the occasion.

### CHAPTER III.

#### *Of the General Secretary.*

ARTICLE I. The General Secretary shall be elected annually and shall receive from the Treasurer an annual salary not to exceed \$1200, and the amount of his expenses incident to the meeting, in addition to his salary. He shall give bond for the proper disposition of the funds of the Association which may come into his hands, in such amount as may be prescribed by the Council.

ARTICLE II. He shall keep fair and correct minutes of the proceedings of the general sessions, and carefully preserve, on file, all reports, essays and papers of every description presented to the Association, and shall be charged with the necessary foreign and scientific correspondence, and with editing, publishing, and distributing the Report on the Progress of Pharmacy, under the direction of the Council.

ARTICLE III. He shall read all papers handed him by the President for that purpose, shall call and record the ayes and nays, whenever they are required to be called; shall notify the chairman of every standing and special committee of his appointment, giving him a list of his colleagues, and stating the business upon which the committee is to act.

### CHAPTER IV.

#### *Of the Local Secretary.*

ARTICLE I. The Local Secretary shall reside at or near the place where the next annual meeting of the Association is to be held.



ARTICLE II. He shall assist the General Secretary in his duties; shall co-operate with the Council and any Local Committee in making arrangements for the annual meeting; shall correspond with the chairmen of the several committees, and with other members, in advance of the meeting, for the promotion of its objects, and shall have the custody of specimens, papers, and apparatus destined for use or exhibition at the meetings.

ARTICLE III. An exhibition of objects interesting to pharmacists may be held each year, should the Council so determine, under the direction of the Local Secretary and the Committee on Commercial Interests.

## CHAPTER V.

### *Of the Treasurer.*

ARTICLE I. The Treasurer shall collect and take charge of the funds of the Association, and shall hold, sign, and issue the certificates of membership.

ARTICLE II. He shall pay no money except on the order of the General Secretary, accompanied by the proper vouchers.

ARTICLE III. He shall report to the Council, previous to each annual meeting, the names of such members as have failed to pay their annual dues for three years.

ARTICLE IV. He shall present a statement of his accounts at each annual meeting of the Council, that they may be audited; he shall receive an annual salary not to exceed \$1,000, and the amount of his expenses incident to the meeting, in addition to his salary.

ARTICLE V. The Treasurer, in order that he may qualify for the office to which he has been elected, shall file a good and sufficient bond or bonds for the amount of \$15,000 with the Chairman of the Council for the faithful performance of his duties as Treasurer, this bond or bonds to be signed and executed by a Trust Company acceptable to the Council.

## CHAPTER VI.

### *Of the Reporter on the Progress of Pharmacy.*

ARTICLE I. The Reporter on the Progress of Pharmacy shall be elected annually, and shall receive from the Treasurer for his services an annual salary not to exceed \$1200.

ARTICLE II. All journals and volumes received in exchange for the Report on the Progress of Pharmacy by the General Secretary, and such other journals as shall be deemed necessary, shall be sent to him by that officer for use in the compilation of his report; for all of which he shall be held responsible until returned to the General Secretary for preservation.

ARTICLE III. From these and other available sources, he shall prepare a comprehensive report on the improvements and discoveries in Pharmacy, Chemistry and Materia Medica, and the collateral branches of knowledge; together with such data as will furnish an epitome of the progress and changes in the science and practice of Pharmacy, and of its votaries, at home and abroad.

ARTICLE IV. The Report on the Progress of Pharmacy shall be edited, published and distributed under rules and regulations approved by the Council. It shall be issued as a yearly volume, covering each fiscal year of the Association.

ARTICLE V. In case of the illness or other inability of the Reporter to carry on the work of the report, the General Secretary and the Chairman of the Council shall be required to make the best arrangements they can command to continue the work to its completion.

## CHAPTER VII.

### *Of the Council.*

ARTICLE I, *Section 1.* The business of the Association which is not of a scientific character shall be in charge of a Council, which is empowered to transact business for the Association between the times of meeting, to reduce any appropriations that have been made, whenever in their judgment the current receipts are not sufficient to allow the expenditure, and to perform such duties as may from time to time be committed to them by the Association; their acts, however, being subject to revision by the Association.

*Section 2.* Any member of the Association may attend the meetings of the Council, and may, by permission of the presiding officer, be permitted to speak on any subject under discussion.

ARTICLE II. The Council shall consist of *ex-officio* members; one member from each local branch of this Association and nine other members, selected from such members as have had at least three years' membership in this Association, shall be elected by ballot by the Association in the following order: Three of them to serve for one year, three for two years, three for three years. At each subsequent annual meeting, three members shall be elected to take the place of those whose terms will then expire, to serve for the term of three years.

ARTICLE III. The President, Vice-Presidents, General Secretary, Local Secretary, Treasurer, Reporter on the Progress of Pharmacy, Editor-in-chief of the JOURNAL, the Chairmen of the Sections of the Association, the Secretary of the Council, and the Historian of the Association shall be *ex-officio* members of the Council.

ARTICLE IV. Vacancies which may occur in the Council shall be filled for the unexpired term or terms by the Association at its next annual meeting.

ARTICLE V. The officers of the Council shall consist of a Chairman, Vice-Chairman, and a Secretary, to be elected by ballot annually by the Council.

ARTICLE VI. The Council shall be charged with the examination of the credentials of delegates, and the transaction of unfinished business of the Association from one annual meeting to another, and with collecting, arranging, and expediting the business of the Association during the sessions of the annual meeting.

ARTICLE VII. There shall be elected annually by ballot, by the Council, two standing committees of the Council—a Committee of Publication and a Committee on Finance—to whom shall be referred such duties as are appropriate to their respective functions, as the Council shall direct; they shall report annually to the Council, and at such other times as the Council may direct.

Whenever deemed advisable by the Council, it shall after the publication of each edition of the National Formulary appoint a committee of fifteen members from the general membership of the Association, which committee shall have charge of the revision of the Formulary. This committee shall report annually,

or as often as required, to the Council, and shall continue to serve until the edition for which it was appointed has been completed. Vacancies occurring in this committee shall be filled by the Council as quickly as is expedient.

ARTICLE VIII, *Section 1.* The Council shall have charge of the revision of the roll of members, and the editing, publication and distribution of all the publications of the Association.

*Section 2.* The Secretary of the Council shall submit to the Council the names of the candidates who have been proposed for membership, when a majority vote shall be sufficient to elect them.

ARTICLE IX. The Council shall furnish to each member of the Association, not in arrears, one copy of the Report on the Progress of Pharmacy, which publication shall contain, in addition to the report, a list of the officers and committees, prefatory matter, constitution and by-laws, general rules, roll of members, list of members, and such other matter as may be deemed desirable by the Council. It shall fix, also, the price for which copies of the Report may be sold.

ARTICLE X. The Council shall issue a monthly journal, beginning in January, 1912, and thereafter, under rules and regulations to be adopted by the Council, and shall furnish copies of such publication to each member of the Association not in arrears for subscription. The publication shall contain editorials, original articles, the proceedings of the annual meetings, of the Council, and of the branches, and such other matter as may be deemed desirable by the Council.

## CHAPTER VIII.

### *Of Membership.*

ARTICLE I. Every pharmacist and druggist of good moral and professional standing whether in business on his own account, retired from business, or employed by another, and those teachers of Pharmacy, Chemistry and Botany who may be especially interested in Pharmacy and Materia Medica, also editors and publishers of pharmaceutical journals, who, after duly considering the objects of the Association and the obligations of the Constitution and By-Laws, subscribe to them, are eligible to membership; provided that any person whose name has been dropped from the roll of members for non-payment of dues may be readmitted after having again made application in regular form, the application being accompanied by the usual fee; or he may be readmitted, without such application, on payment of all back dues; in the latter case his membership shall date from the time when he first joined the Association, as previously printed in the Roll of Members, and notice of such action shall be inserted in the addendum to the Treasurer's report.

ARTICLE II. Every application for membership shall require the endorsement of two members of the Association in good standing, and each applicant must receive the affirmative vote of a majority of the members of the Council for election, after which his membership shall be completed by his signing the Constitution and By-Laws and paying the annual dues for the current year. Any newly elected member, upon the payment of annual dues for the year in which he is elected, shall be entitled to the annual volume of the Report on the Progress of Pharmacy and such other publications of the Association as are distributed to its members free of charge during the year. Any application for

membership made during the fiscal year (the calendar year shall be the fiscal year of the Association) shall apply to the current fiscal year; except between June and January, when, if desired, it can be made to apply to the next fiscal year, if so stated on the application. The publications will be sent for the fiscal year in which the dues and subscription are credited.

The price for the Report on the Progress of Pharmacy to non-members shall be fixed by the Council. The subscription price for the JOURNAL of the Association shall be four dollars per annum to members and non-members alike. The subscription to the JOURNAL must be separate and distinct from the annual dues, although both may be paid at one and the same time.

ARTICLE III. Every member shall pay *in advance* to the Treasurer the sum of four dollars as annual dues, and by neglecting to pay said contribution for *six successive months*, may be dropped from the roll of members. If the annual dues (four dollars) and the annual subscription to the JOURNAL (four dollars) be paid at one and the same time, a reduction of three dollars shall be allowed.

ARTICLE IV. Any member of the Association who shall pay to the Treasurer the sum of \$100.00 during the first year of his connection therewith, and also any member not in arrears, who after ten years shall pay the sum of \$75.00, or after fifteen years the sum of \$50.00, or after twenty years the sum of \$40.00, or after twenty-five years the sum of \$25.00, and any member who may have paid annual dues for thirty-seven consecutive years, shall become a life-member, and shall be exempt from all future annual contributions.

ARTICLE V. All local organizations of Pharmacists shall be entitled to five delegates as their representatives in the annual meetings, who, if present, become members of the Association on signing the Constitution and paying the annual contribution for the current year: Provided, that the provisions of this article shall not be so construed as to reinstate any member whose name shall have been dropped from the roll for non-payment of dues; nor shall any one who has been expelled from the Association be received as a delegate. All credentials shall be sent to the General Secretary at least two weeks in advance of the annual meeting.

ARTICLE VI. Members shall be entitled, on the payment of Three Dollars or of Five Dollars, to receive from the Treasurer, respectively, a paper or parchment certificate of membership signed by the President, one Vice-President, the General Secretary, and the Treasurer.

ARTICLE VII. Resignations of membership shall be made in writing to the General Secretary or Treasurer, but no resignation shall be accepted from any one who is in arrears to the Treasury.

All resignations shall be acknowledged in writing by the officer who receives them, and shall be reported to the Council.

ARTICLE VIII. Any member may be expelled for improper conduct, or the violation of the Constitution, By-Laws, or Ethics, adopted by the Association, but no person shall be expelled unless he shall receive for expulsion two-thirds of all the votes cast at a general session.

ARTICLE IX. Pharmacists, chemists, and other scientific men who may be thought worthy the distinction, may be elected honorary members. They shall not, however, be required to contribute to the funds, nor shall they be ~~eligible to hold office or vote at the meetings~~



## CHAPTER IX.

*Of Meetings and Sections.*

ARTICLE I. The meetings shall be held annually: Provided, that in case of failure of this, from any cause, the duty of calling the Association together shall devolve upon the President, or one of the Vice-Presidents, with the advice and consent of the Council.

ARTICLE II. To expedite and render more efficient the work of the Association, the following Sections are provided:

1. Scientific Section, with four subdivisions: (a) Chemistry, (b) Botany and Pharmacognosy, (c) Biologic Assays, (d) Bacteriology.
2. Section on Commercial Interests.
3. Section on Practical Pharmacy and Dispensing.
4. Section on Pharmaceutical Legislation and Education.
5. Section on Historical Pharmacy.
6. Women's Section.

Upon the approval of the Council additional Sections may be organized from time to time as necessitated. Each Section, through its officers, shall solicit papers and propose suitable subjects for discussion at the annual meeting, arrange the business of the Section in advance, and perform such duties as may be referred to it. It shall make reports to the Council or Association if requested. The conduct of the work of each Section shall be under by-laws, rules and regulations approved by the Council. All committees proposed or appointed by the Sections shall be subject to the approval of the Council.

ARTICLE III. The business of the Association shall be arranged so that the labors of each Section shall be considered only at the session or sessions to which they are especially assigned.

ARTICLE IV. The first, second and last sessions of the annual meeting shall be devoted to the general business of the Association, and sufficient time shall be assigned to the Association at the beginning of all other sessions to read the minutes of the Council, act on the report of Council on membership, and receive propositions for amendments to the By-Laws.

ARTICLE V. A Chairman and Secretary shall be elected by ballot by each Section (except the Scientific Section which elects its officers in accord with the by-laws of said Scientific Section) to serve at the sessions of said Section. The minutes of each session, together with all documents and papers which belong to each Section, must be placed as soon as possible in the hands of the General Secretary for publication and safe-keeping.

ARTICLE VI. The Chairman of each Section (except the Scientific Section whose officers act in accord with the by-laws of said Scientific Section) shall preside at each of its sessions, and shall prepare a short address treating upon the subjects connected with his section, to be read before the Section at the annual meeting.

ARTICLE VII. The officers of the Section on Commercial Interests shall be charged with the work of arranging in advance the business to come before the Section at the next annual meeting; shall propose each year a subject for discussion at the meetings of the State Associations, and at the following annual

meeting of this Association shall present a report of the action of the State Associations upon the subject proposed.

ARTICLE VIII. The chairman of the Section on Practical Pharmacy and Dispensing shall appoint a committee of three on pharmacopoeias and formularies to cooperate in the work of the Section by obtaining papers on the subjects of pharmacopoeias and formularies and discussions thereon. The officers shall arrange in advance of the meeting the business to come before the Section.

ARTICLE IX. The officers of the Section on Pharmaceutical Legislation and Education shall keep a record of, and compile for reference, the enactments of the different States regulating the practice of pharmacy and the sale of medicines; shall report at each stated meeting of the Association what legislation on pharmaceutical subjects has occurred during the year; shall arrange the business of the Section in advance of its sessions, propose suitable subjects for discussion, and shall attend to such duties as may be delegated to them by the Section; shall propose each year a subject for discussion at the meetings of the State Associations, and, at the following annual meeting of this Association, shall present a report of the action of the State Associations upon the subject proposed.

ARTICLE X. The officers of the Section on Historical Pharmacy shall arrange the business of the Section and shall present annually matters of special historical interest in pharmacy; and shall also secure the collection of letters, papers, etc., written by members of the Association, which when so collected shall remain in the custody of the Section and be available for reference to any one interested.

ARTICLE XI. The Women's Section shall consist of women who are regular members in good standing in the American Pharmaceutical Association, and the women of the families of regular members in good standing, united for the purpose of promoting the aims of the American Pharmaceutical Association and for advancing the interests of women engaged in pharmaceutical pursuits.

ARTICLE XII. The order of business at the first session of each annual meeting shall be as follows:

Section 1. Promptly at the time named in the notice issued for the meeting, the President, or, in his absence, one of the Vice-Presidents, or, in their absence, a President *pro tempore*, shall officiate.

Section 2. In the absence of the General Secretary, the President shall appoint a Recording Secretary *pro tempore*, who shall perform the duties of the General Secretary until his arrival.

Section 3. Nineteen members shall constitute a quorum for the transaction of business.

Section 4. The President's Address may then be read, after which the Council shall report the list of properly accredited delegates.

Section 5. Reports of Committees shall be presented, read by their titles, synopsis or in full, and laid on the table for future consideration.

Section 6. An abstract of the minutes of the Council shall be read at the annual meeting of the Association, and the acts of the Council shall be approved, amended or revised so as to be acceptable to the Association. At any general session, a member may request further information upon any matter reported on by the Council.



*Section 7.* The President shall call the roll of States, the Territories, District of Columbia and the Provinces of Canada, requesting the members present from each State or Territory to appoint two members, the persons so selected to act as a Committee to nominate officers for the Association and members of the Council for the ensuing three years; in addition to which the President shall appoint five members from the Association-at-large to act with the Committee. Delegates who are not members must complete their membership before they are eligible to serve on the Nominating Committee.

*Section 8.* Incidental business.

ARTICLE XIII. The order of business at the second general session at each annual meeting shall be as follows:

*Section 1.* The President shall call the Association to order.

*Section 2.* The Secretary shall read the minutes of the preceding session, which may be amended, if necessary, and shall then be approved.

*Section 3.* The Report of the Committee on Nominations shall be read.

*Section 4.* Reading of the Minutes of the Council.

*Section 5.* Reading of the Reports of the Treasurer and General Secretary.

*Section 6.* Reports of Standing Committees shall be read.

*Section 7.* Reports of Special Committees shall be read.

*Section 8.* Incidental business.

*Section 9.* Adjournment subject to the call of the President.

ARTICLE XIV. The order of business for the sessions of the Sections shall be determined by each Section for itself.

ARTICLE XV. No money shall be appropriated from the Treasury by any of the Sections.

ARTICLE XVI. At the last general session of the Association the newly elected officers of the Association shall take their respective places.

ARTICLE XVII. The Council may arrange for such social sessions, to be held after the adjournment of the last general session, as it may deem expedient, but no business of the Association can be transacted at these social sessions.

## CHAPTER X.

### *Of Committees.*

ARTICLE I. There shall be appointed or elected standing committees as follows: A Committee on United States Pharmacopocia, a Committee on Transportation, and a Committee on Resolutions, each to consist of ten members, a Committee on Pharmaceutical Syllabus, to consist of seven members; a Committee on Time and Place of Meeting; a Committee on Ebert Prize, and a Committee on General Prizes, each to consist of three members; and a Committee on Program.

ARTICLE II. Any person desiring to submit a paper to the Association shall present to the Chairman of the particular Section to which it refers at least ten days prior to the meeting, an abstract of said paper, indicative of its contents, and consisting of not less than fifty nor more than two hundred words.

This abstract shall be printed as a part of the program. The paper itself must be submitted to the officers of the Section previous to the first session.

Not more than ten minutes shall be allowed for the presentation of any paper, unless by unanimous consent of the Section. This does not apply to the Scientific Section, which handles its papers in accord with the by-laws of said Scientific Section.

All papers presented to the Association and its branches shall become the property of the Association, with the understanding that they are not to be published in any other publications than those of the Association, except by the consent of the Committee on Publication.

ARTICLE III. The Committee on the Ebert Prize, which shall be appointed by the Chairman of the Scientific Section, shall, at the next annual meeting after the one at which essays are presented, determine which, if any of them, has met the requirements of the founder of the prize. In all respects it shall be governed by the stipulations expressed by the donor.

ARTICLE IV. The Committee on General Prizes, which shall be appointed by the President, shall, at the next annual meeting after the one at which the papers are presented, determine which, if any of them, are worthy of prizes, and decide upon the relative merits of such papers as are deemed worthy.

ARTICLE V. The Committee on the United States Pharmacopoeia shall be appointed by the President of the Association as follows: One member to be appointed for ten years and one for nine, eight, seven, six, five, four, three, two and one years, respectively, each vacancy occurring by expiration of term to be filled by a new appointment for ten years. The Committee shall elect its own Chairman annually. It shall collect statistics regarding the frequency with which official and non-official remedies are used in legitimate practice, and shall endeavor to ascertain the general wishes and requirements of the profession throughout the country in regard to any desired changes or improvements in the Pharmacopoeia. It shall also note errors of any kind found in the U. S. Pharmacopoeia, so as to facilitate and aid the work of the National Committee of Revision of the U. S. P.

ARTICLE VI. The Committee on Transportation, which shall be elected by the Council, shall consist of one member each from the cities of Boston, New York, Chicago, St. Louis, Cincinnati, New Orleans, Atlanta, St. Paul or Minneapolis, Denver, Baltimore, Cleveland and San Francisco, and in conjunction with the General Secretary and the Local Secretary, who shall be members of the Committee, shall arrange for transportation from the different sections of the United States and Canada to the place of meeting and return. The Council shall annually elect the Chairman of this Committee.

ARTICLE VII. The Committee on Pharmaceutical Syllabus shall be appointed by the President of the Association as follows: One member shall be appointed for seven years, and one for six, five, four, three, two and one years, respectively; each vacancy occurring from expiration of term shall be filled for a term of seven years; other vacancies shall be filled at the annual meetings of the Association for the unexpired terms. This committee shall report to the Association through the Section on Pharmaceutical Legislation and Education, shall be members of the National Committee on Pharmaceutical Syllabus and shall recommend to the Association its proportionate share of the current expenses.

ARTICLE VIII. The reports of all committees of the Association must be

sent to the General Secretary in time for presentation at the first general session of the annual meeting of the Association.

ARTICLE IX. The Committee on Resolutions shall be appointed at the first session of the annual meeting, five members by the President of the Association and five by the Chairman of the Council. The Committee shall hold open session for the consideration of matters referred to it either by the Association, any Section or by the Council, and to obtain the opinion of the members thereon and report to the referring bodies.

ARTICLE X. The Committee on Program shall consist of the Local Secretary, the General Secretary and the Secretary of the Council. It shall be the duty of the committee to prepare and submit to the Council the program for the annual meeting so that same can be published in the JOURNAL at least two months in advance of the annual meeting.

## CHAPTER XI.

### *Rules of Order and Debate.*

ARTICLE I. The ordinary rules of parliamentary bodies shall be enforced by the presiding officer, from whose decision, however, appeals may be taken, if required by two members, and the meeting shall thereupon decide without debate.

ARTICLE II. When a question is regularly before the assembly and under discussion, no motion shall be received but to adjourn, to lay on the table, for the previous question, to postpone to a certain day, to commit or amend, to postpone indefinitely; which several motions have precedence in the order named. A motion to adjourn shall be decided without debate.

ARTICLE III. No member may speak twice on the same subject, except by permission, until every member wishing to speak has spoken.

ARTICLE IV. On the call of any two members, the ayes and nays shall be ordered, when every member shall vote, unless excused by a majority of those present, and the names and manner of voting shall be entered on the minutes.

ARTICLE V. On all points of order not covered in these By-Laws, the Association shall be governed by the established usages in all assemblies governed by parliamentary rules.

## CHAPTER XII.

### *Local Branches.*

ARTICLE I. Local branches of this Association may be formed whenever it may appear that twenty-five members of this Association, in good standing, will participate, provided that no more than one such branch shall be formed in any one state, province, district or territory, unless the additional branches shall be formed at a point distant one hundred miles or more from any branch already established in the same state, province, district or territory.

ARTICLE II. All active or voting members of local branches must be members of this Association in good standing.

ARTICLE III. The objects and aims of local branches of this Association shall be the same as set forth in Article I of the Constitution of this body, and the acts of local branches shall in no way commit or bind this Association, and can only serve as recommendations to it. And no local branch shall enact any article of constitution or by-law to conflict with the Constitution or By-Laws of this Association.

ARTICLE IV. Each local branch having twenty-five active or voting members shall be entitled to elect one member every three years, who shall become and continue a member of the Council of this Association for that time.

## CHAPTER XIII.

### *Miscellaneous.*

ARTICLE I. Every proposition to alter or amend these by-laws shall be submitted in writing at a general session, and may be balloted for at any subsequent general session, when, upon receiving the votes of three-fourths of the members present, it shall become a part of the by-laws.

## BY-LAWS OF THE COUNCIL

(Revised to August 29, 1914, inclusive.)

### CHAPTER I.

#### *Of the Election of Officers.*

ARTICLE I. The officers of the Council shall consist of a Chairman, a Vice-Chairman and a Secretary, who shall be elected by ballot by the Council, to serve one year.

ARTICLE II. They shall be elected and shall assume the duties of their respective offices after the election of new members of the Council by the Association.

### CHAPTER II.

#### *Of the Chairman and Vice-Chairman.*

ARTICLE I. The Chairman shall preside at all meetings of the Council; in his absence or on account of inability from any cause, the Vice-Chairman, or, in the absence of both, a Chairman *pro tempore*, shall perform the duties of the Chairman.

ARTICLE II. The Chairman of the Council shall confer with the Chairman of the various special and standing committees of the Association, during its sessions, in order to arrange and expedite the business of the Association.

### CHAPTER III.

#### *Of the Secretary.*

ARTICLE I. The Secretary shall keep fair and correct minutes of the proceedings of the meetings, and carefully preserve all reports and papers of every description received by the Council. He shall receive an annual salary not to exceed \$300.

ARTICLE II. He shall read all the papers handed him by the Chairman for that purpose; shall call and record the ayes and nays whenever they are re-



quired to be called; he shall notify the Chairman of every special committee of his appointment, giving him a list of his colleagues, and stating the business upon which the committee is to act, and shall notify every member of the time and place of each meeting of the Council.

#### CHAPTER IV.

##### *Of Committee on Publication.*

ARTICLE I. The Committee on Publication shall consist of five members, to be elected by ballot by the Council, together with the Editor-in-chief of the JOURNAL, the General Secretary, the Reporter on the Progress of Pharmacy and the Treasurer as *ex-officio* members. The Council shall elect the Chairman.

ARTICLE II. The Committee on Publication shall have charge of the editing, publication and distribution of the Report on the Progress of Pharmacy and the JOURNAL of the Association, and such other publications as may be issued, under rules and regulations to be approved by the Council.

ARTICLE III. The Editor-in-chief of the JOURNAL shall be elected annually, and shall receive from the Treasurer for his services such compensation as the Council may direct.

ARTICLE IV. The Editor-in-chief of the JOURNAL shall have charge of the editing, publication and distribution of the JOURNAL subject to the rules and regulations of the Committee on Publication.

ARTICLE V. In case of illness or other inability of the Editor-in-chief to carry on the work of the JOURNAL, the Committee on Publication shall be authorized to make the best arrangements possible to continue the work.

#### CHAPTER V.

##### *Of Committee on Finance.*

ARTICLE I. The Finance Committee shall consist of three members and shall, each year, previous to January 1, present to the Council for its consideration a list of appropriations to cover the various expenditures of the ensuing fiscal year. No payment shall be made in excess of any of the said appropriations, except by a special vote of the Council. Provided however, that the Treasurer is authorized to transfer from one appropriation account to another such amount as may be needed at any time, the amount of any such transfer not to exceed the sum of fifty (\$50.00) dollars.

All motions and resolutions involving the expenditure of any sum in excess of \$25.00 shall have the approval of the Finance Committee before being acted upon by the Council.

All appropriations made for any fiscal year shall lapse at the end of the said fiscal year. Provided, however, that accounts properly chargeable against any of said appropriations prior to their expiration, but not received by the General Secretary until after the end of the fiscal year, may be paid from such appropriation, in case the warrant for such payment be drawn not later than twenty days after the expiration of said fiscal year.



## CHAPTER VI.

*Of Committee on Centennial Fund.*

ARTICLE I. A Committee on the Centennial Fund shall be formed, consisting of the President or one of the Vice-Presidents of the Association, of the Chairman of the Committee on Finance, and the General Secretary. It shall receive applications in writing from members for grants from the interest derived from the Centennial Fund, the applications to be accompanied by a statement of the investigation to be made, and of the amount and cost of material required—it being understood that the results of the investigation, together with a full report thereon, be laid before the annual meeting of the Association.

ARTICLE II. The Committee shall consider these applications, and at as early a date as possible shall report to the Council an outline of the proposed investigations, together with such recommendations of grants from the available funds as it may deem proper.

ARTICLE III. The Council shall decide upon these recommendations, and in case the grants be approved, the Chairman of the Council shall direct orders to be drawn upon the Treasurer in favor of those members to whom grants have been made.

## CHAPTER VII.

*Of Sessions.*

ARTICLE I. The Council shall meet previous to the assembling of the Association, and at such other times as it may determine, or at the call of the Chairman.

ARTICLE II. On the written application of three members to the Chairman of the Council, a special session shall be called.

ARTICLE III. Nine members of the Council shall constitute a quorum.

ARTICLE IV. The order of business at the first session of the Council shall be as follows:

1. Organization by the election of the Chairman, Vice-Chairman and the Secretary.
2. Election of the Standing Committees of Council, as follows:
  - a. Committee on Finance, three members.
  - b. Committee on Publication, five members.
  - c. Committee on Centennial Fund, three members.
3. Unfinished and deferred business from the last Council, or such business as is especially referred to the Council from the Association.
4. Reading the names of candidates for membership.
5. Reading of reports and appointment of committees.
6. New business.
7. Adjournment and before the final adjournment, the minutes of the last session of the Council shall be read and approved.

## CHAPTER VIII.

*Miscellaneous.*

ARTICLE I. Three members of any of the Standing Committees shall constitute a quorum for the transaction of business.

ARTICLE II. In all questions arising before the Council or its Committees, and which can be disposed of by a positive or negative vote, the Chairman of the Council, or the Chairman of the Committee, may take the vote of their respective bodies in writing, and the same shall have the same force and effect as if members had been personally present, a majority of the votes cast being considered sufficient to decide a question. The ayes and nays of such votes taken by the Council shall be entered upon the minutes.

ARTICLE III. Every proposition to alter or amend these By-Laws shall be submitted in writing, and may be balloted for at the next session of the Council, when, upon receiving the vote of three-fourths of the members present, it shall become a part of these By-Laws.

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## BY-LAWS OF THE SCIENTIFIC SECTION OF THE AMERICAN PHARMACEUTICAL ASSOCIATION

(Revised to August 29, 1914, inclusive.)

## SECTION I.

## NAME.

ARTICLE I. This organization shall be known as the Scientific Section of the American Pharmaceutical Association.

## SECTION II.

## MEMBERSHIP.

ARTICLE I. All members of the American Pharmaceutical Association in good standing, who express a desire to do so, by registering their names with the Secretary of the Section, shall become members of the Section.

## SECTION III.

## OFFICERS.

ARTICLE I. The officers of the Section shall be a Chairman, a First Vice-Chairman, a Second Vice-Chairman and a Secretary, selected from members of the Section.

## SECTION IV.

## ELECTION OF OFFICERS.

ARTICLE I. The Chairman of the Section shall at the first session appoint a committee of three, who shall report to the Section at the same session two names for each office. At the last session of the Section these names shall be balloted upon, and the one receiving a majority for that particular office shall be declared elected. These shall then be installed and shall hold office for one year or until their successors are duly elected.

ARTICLE II. Officers may be re-elected, but with the exception of the Secretary shall not hold the same office for more than two consecutive years.

ARTICLE III. The Council of the Association shall fill any vacancies that may occur among the officers.

## SECTION V.

### DUTIES OF OFFICERS.

#### *Chairman and Vice-Chairmen.*

ARTICLE I. It shall be the duty of the Chairman to represent the Section in the Council of the Association, to preside at the annual meetings of the Section, appoint all committees of the Section and fill any vacancies when occurring in these committees. He may present an annual address on any subject of interest to the Section that he may deem of sufficient importance.

ARTICLE II. In the absence of the Chairman the First Vice-Chairman shall preside and exercise all the functions of the Chairman.

ARTICLE III. In the absence of the Chairman and the First Vice-Chairman the Second Vice-Chairman shall preside and exercise all the functions of the Chairman.

ARTICLE IV. In the absence of all three of these officers the Section shall elect a temporary Chairman.

#### *Secretary.*

ARTICLE V. The Secretary shall keep a record of the proceedings of the Section, shall send to the members such notice as the business of the Section may require, shall transmit to the General Secretary the names of the officers and committees elected or appointed, and notify the General Secretary of any changes in the personnel of the officers or committees of the Section, and shall furnish the General Secretary a report of the sessions held at the annual meeting. The Secretary, at least two months in advance, shall write to each member of this Section, giving notice of the latest date upon which papers can be accepted for the program.

ARTICLE VI. The Secretary shall be custodian of the records and documents of the Section, as well as of all funds, and shall make all disbursements subject to the approval of the Chairman.

ARTICLE VII. The Secretary shall arrange the program for the annual meeting, and furnish the editor of the JOURNAL of the Association the program for inclusion in the number just preceding the annual meeting.

ARTICLE VIII. The Secretary shall at each annual meeting present a brief report to the Association of the condition within the Section.

ARTICLE IX. In case the Secretary is unable to attend the annual meeting, he shall notify the Council to that effect and the Council shall then appoint a temporary Secretary.

## SECTION VI.

## MEETINGS.

ARTICLE I. At least three sessions of the Section shall be held at each annual meeting of the Association. Additional sessions may be held at any time during the meeting when the officers of the Section may see fit, and by consent of the Council; provided, however, that these sessions be so arranged that they conflict as little as possible with sessions of other Sections, and that no session be held simultaneously with the final session of the Association.

## SECTION VII.

## ORDER OF BUSINESS.

ARTICLE I. The order of business at the first session shall be as follows: (1) Chairman's Address; (2) Secretary's Report; (3) Report of Standing Committees and Committees of the Association which report to this Section; (4) Nomination of Officers; (5) Miscellaneous Business; (6) Reading of Papers.

ARTICLE II. The time of the other sessions shall be taken up with the reading of papers, excepting as provided for in Section IV (Election of Officers, and Section X (Amendments), or to hear the reports of special committees.

ARTICLE III. Provided, however, that discussion of papers may be interrupted at any time to consider matters referred to the Section by the Association in general session or by the Council.

ARTICLE IV. This regular order of business may be suspended at any time during a session, for that particular session, by a three-fourths vote of those present.

## SECTION VIII.

## EXPENSES.

ARTICLE I. The expense of printing, postage and stationery shall be paid from the Association treasury, but in no case to exceed \$25.00 for one year.

ARTICLE II. Appropriations for expenses other than those named here must be procured by authority of Council through the Chairman of the Section.

## SECTION IX.

## PAPERS.

ARTICLE I. Original papers on any subject of scientific interest may be accepted at the discretion of the officers of the Section.

ARTICLE II. The complete title and a brief extract of all papers, not to exceed 250 words, must be in the hands of the Secretary in time for inclusion in the program which is published, as provided in Section V, Article 7.

ARTICLE III. Fifteen minutes shall be allowed for the reading of a paper. If the paper is too lengthy to be read in detail within this space of time, it shall be presented in abstract.

ARTICLE IV. Each speaker in the discussion of a paper shall be allowed five minutes, but all such discussion shall be confined to the paper or subject under consideration at that time.



ARTICLE V. The time allowed for presenting a paper or discussion may be extended by unanimous consent of those present.

ARTICLE VI. All papers and reports presented to the Section become the property of the Association and shall be forwarded to the Editor of the JOURNAL immediately following the annual meeting by the Secretary of the Section.

## SECTION X.

### AMENDMENTS.

ARTICLE I. These by-laws may be amended at the final session of any annual meeting by a two-third vote of those present, provided notice of such amendment is given together with the text thereof at any previous session held at that meeting. Amendments must finally be accepted by the Council as not in conflict with the Constitution and By-Laws of the Association.

## SECTION XI.

### MISCELLANEOUS.

ARTICLE I. Questions not specifically covered by these by-laws shall always be decided in accord with the Constitution and By-Laws of the Association.

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# BY-LAWS OF THE HOUSE OF DELEGATES OF THE AMERICAN PHARMACEUTICAL ASSOCIATION

(Revised to August 29, 1914, inclusive.)

## CHAPTER I.

ARTICLE I. Functions. The House of Delegates shall have and exercise the following functions:

A. To receive and consider the reports of delegates from the bodies which they represent in the House of Delegates.

B. Consider and report upon such resolutions and upon such other subjects as may be referred to the House of Delegates by the Council or by the Association in general session, or by the various Sections.

C. Make a final report of the business transacted by the House of Delegates to the final session of the outgoing Council at each annual meeting.

D. It shall have the authority to adopt all rules and regulations necessary for the proper conduct of its business and not inconsistent with the Constitution and By-Laws of the Association and the Council.

## CHAPTER II.

ARTICLE I. Representation. The membership of the House of Delegates shall consist of three regularly elected or appointed delegates from the Local Branches of the American Pharmaceutical Association, State and Local Societies, Colleges and Schools of Pharmacy and delegates from the National Association of Retail Druggists, National Wholesale Druggists' Association, American Medical Association, National Association of Boards of Pharmacy, Women's Organization of the National Association of Retail Druggists, National Associa-



tion of Manufacturers of Medicinal Products, American Chemical Society, Association of National and State Food and Dairy Departments, Association of Official Agricultural Chemists, and from the departments of the Army, Navy and Public Health and Marine Hospital Service, the American Association of Drug Clerks, the credentials of whom shall be approved by the Council; together with five members of the Council, appointed by the Chairman of the Council. The President, President-elect, Treasurer, General Secretary and the Chairman and Secretary of the Council shall be members *ex-officio*.

ARTICLE II. Term of Service. The elected or appointed delegates shall hold office for one year, or until the credentials of their successors shall have been approved by the Council.

### CHAPTER III.

ARTICLE I. Organization. The first session of the House of Delegates at each annual meeting shall be called to order by the Chairman, or one of the Vice-Chairmen, or the Secretary of the preceding House; or, in the absence of all of these, by the Secretary of the Council.

ARTICLE II. Voting. Each delegate shall be entitled to one vote. No delegate shall act as proxy of another delegate who has not been seated, nor as delegate for more than one association, organization, or institution.

ARTICLE III. Privileges. Any member of the American Pharmaceutical Association may attend any session of the House of Delegates and shall have the privilege of the floor.

### CHAPTER IV.

ARTICLE I. Officers. The officers of the House of Delegates shall consist of a Chairman, two Vice-Chairmen and a Secretary, who shall be elected annually by ballot by the House of Delegates.

ARTICLE II. Duties of Chairman and Vice-Chairmen. The Chairman shall preside at all meetings of the House of Delegates; in his absence, or on account of inability from any cause, the First Vice-Chairman; or, in his absence, the Second Vice-Chairman; or in the absence of the three, a Chairman *pro tempore* shall perform the duties of the Chairman.

ARTICLE III. Duties of Secretary. The Secretary shall keep fair and correct minutes of the proceedings of the meetings and carefully preserve all reports and papers of every description received by the House of Delegates, and deliver the same to the Secretary of the Council at the annual meeting. The Secretary shall read all papers received for the purpose; shall call and record the ayes and nays whenever they are required to be called; shall notify the Chairman of every special committee of his appointment, giving a list of his colleagues, and stating the business on which the committee is to act, and shall give notice of the time and place of each meeting of the House of Delegates.

### CHAPTER V.

ARTICLE I. Sessions. The House of Delegates shall hold at least one session during the annual meeting of the Association at an hour previously determined by the Council and such additional sessions as may be necessary for the transaction of its business.

## CHAPTER VI.

ARTICLE I. The Committee on Resolutions. The Chairman shall appoint a Committee on Resolutions consisting of five members, to which shall be referred all resolutions and which shall report to the House the results of its deliberation not later than the last session of the House.

ARTICLE II. Special Committees. The Chairman shall appoint such Special Committees as may be directed by the House.

## CHAPTER VII.

ARTICLE I. Resolutions. All resolutions shall receive a majority of affirmative votes of those present for adoption.

ARTICLE II. Amendments. Every proposition to amend these by-laws shall be submitted in writing at one session of the House and may be balloted upon at the next session, when upon receiving the affirmative vote of three-fourths of the members present it shall become a part of the by-laws.

## CHAPTER VIII.

## ORDER OF BUSINESS.

The following shall be the Order of Business:

1. Calling Roll of Delegates whose credentials have been approved by the Council.
2. Appointment of Committee on Resolutions.
3. Reading of communications from the Association, Sections and Council.
4. Calling Roll of Delegations for reports, resolutions and communications, all of which shall be in writing.
5. Miscellaneous business.
6. Election and Installation of Officers.
7. Adjournment to a time certain.

## GENERAL RULES OF THE AMERICAN PHARMACEUTICAL ASSOCIATION

(Revised to August 29, 1914, inclusive.)

*Rule 1. Advertisements for Publications:* At the forty-seventh annual meeting (1889), the Council resolved that no advertisements be solicited or accepted for any of the publications or programs issued by or in the name of the Association, and the General Secretary was instructed to inform annually the Local Secretary and pharmaceutical press of the resolution.

*Rule 2. Term of Council Members from Local Branches:* At the 55th annual meeting (1907), it was ordered that the three-year term of members of the Council elected by Local Branches of the A. Ph. A. shall date from the last annual meeting of the Association held previous to the date of election of the new Council member by a Local Branch.

*Rule 3. Proceedings of N. A. B. P. and A. C. P. F. in A. Ph. A. Proceedings:* At the fifty-seventh annual meeting (1909), it was ordered that space be annually set aside in the Proceedings for abstracts of the proceedings of the meetings of the National Association of Boards of Pharmacy and the American Conference of Pharmaceutical Faculties.

*Rule 4. Salary Year of Officers:* At the fifty-seventh annual meeting (1909), it was ordered that the salary year of the officers of the American Pharmaceutical Association be changed so as to run from July of one year to July of the next year, instead of, as heretofore, from September to September.

*Rule 5. Names of Life Members:* At the fifty-seventh annual meeting (1909), it was ordered that the names of life members, new style, be designated in the published Roll and List of Members by means of heavy-faced or black-faced type.

*Rule 6. Approval of Applications for Membership:* At the fifty-eighth annual meeting (1910), it was ordered that the Committee on Membership submit all names of applicants for membership to the respective State representative on the committee for approval before sending the application to the Secretary of the Committee on Membership for submission to the vote of the Council, or if they be sent direct to the Secretary of the Committee on Membership, they shall be sent by him first to the State representative for approval. The Secretary of the Committee on Membership shall have discretionary power in the application of this rule.

*Rule 7. Resignation of Members:* At the fifty-eighth annual meeting (1910), it was ordered that the resignation of a member may be accepted during the first six months of the fiscal year for which his annual dues are payable.

*Rule 8. Address of Welcome at Opening General Session:* Addresses of welcome and responses thereto at the opening general session shall be omitted.

*Rule 9. Meetings of Council:* The meetings of the Council shall be held in the evenings with the exception of the first and the last sessions.

*Rule 10. Time of Section Meetings:* The work of the various Sections shall start promptly in the morning at 9.30 o'clock, lasting until 12 o'clock, and in the afternoon at 2 o'clock, lasting until 5 or 6 o'clock.

*Rule 11. Section and Association Meetings:* The Section and Association meetings shall be confined to mornings and afternoons.

*Rule 12. Concurrent Meetings of Sections:* The principle of concurrent meetings of the Sections shall be established. There shall be used a series of bulletins in the section rooms notifying members what papers are being read and discussed in the different several Sections.

*Rule 13. Manuscripts for Section Meetings:* The chairmen of the Sections shall use every endeavor to secure all manuscripts within four weeks of the annual meeting, and shall immediately send them to the General Secretary.

*Rule 14. Printing of Accepted Manuscripts:* The General Secretary shall have accepted manuscripts printed in advance of the annual meeting, whenever in the judgment of the Chairman of the Sections and the General Secretary it is desirable.

*Rule 15. Collective Program of Sections:* With all manuscripts in hand three or four weeks before the annual meeting, the General Secretary shall prepare a collective program containing the detailed programs of the different Sections and indicating at what particular session any given paper shall come up for reading and discussion.

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## GENERAL RULES OF FINANCE OF THE AMERICAN PHARMACEUTICAL ASSOCIATION

(Revised to August 29, 1914, inclusive.)

*Rule 1. Deposits of Moneys of Funds:* The Treasurer shall deposit all moneys received by him, except those belonging to the various "Funds," with some reliable banking company, where said money may be drawing interest for the benefit of the Association, said banking company to be designated by the Finance Committee and approved by the Council.

*Rule 2. Payments of Moneys of Funds:* Said moneys shall be deposited in the name of the American Pharmaceutical Association, and shall be paid out by numbered checks drawn by the Treasurer, on written warrant signed by the General Secretary.

*Rule 3. Payment of Bills:* The correctness of every bill shall be certified to by the person contracting the same and the General Secretary, and the latter shall note on the bill the appropriation against which the same is to be charged. The bill shall then be submitted to the Chairman of the Committee on Finance for approval, before payment is made. A warrant shall then be drawn and signed by the General Secretary, upon receipt of which, together with the original bill and voucher, the Treasurer shall draw a check for the amount.

*Rule 4. Deposits in Banks:* The Treasurer shall make a deposit in the bank whenever the money in his hands shall amount to fifty dollars.

*Rule 5. Custodian of Funds:* The Treasurer shall be the custodian of the bonds and saving-bank books, representing the several Funds belonging to the Association; and bonds and bank-books shall be in the name of the Treasurer, and the accounts of the same shall be kept by him.

*Rule 6. Appointment of Auditing Committee:* There shall be annually appointed by the Council an Auditing Committee, this Committee to consist of three members residing in or near the same city or town as that in which the Treasurer resides, the Chairman to be named by the Chairman of the Council.

*Rule 7. Annual Report of Treasurer:* The Treasurer shall balance his books January 1st of each year, and shall make out, previous to the fifteenth day of January following, his annual report for the financial year just closed.

*Rule 8. Auditing of Accounts of Treasurer and General Secretary:* The Treasurer and General Secretary having thus balanced their books and made out their reports, shall place all such books, accounts, vouchers, etc., with the report, at the disposal of the Chairman of the Auditing Committee, at such time and place in January of each year as said Chairman may direct.



The Treasurer, in the presence of another member of the Association, shall make a list of the numbers and amounts of the bonds belonging to the Association, and both shall make affidavit to such list, which shall then be forwarded to the Auditing Committee for their use in auditing the books of the officers of the Association.

*Rule 9. Return of Books to Treasurer and General Secretary:* Said books, accounts, vouchers, saving-bank books and accounts of the same shall be returned to the Treasurer and General Secretary, respectively, within two weeks of the date of their reception by the Chairman of the Auditing Committee.

*Rule 10. Meeting of Auditing Committee:* There shall be a meeting of the Auditing Committee in January of each year, and it shall be the duty of said Committee, at such meeting, to carefully examine all the books, accounts, vouchers, funds, etc., etc., received by them; and previous to the 1st day of February following, to make a report thereon, in writing, to the Chairman of the Council.

*Rule 11. Expense of Bonds of Treasurer and General Secretary:* The expense of the bonds of the Treasurer and General Secretary, given by a Trust Company, shall be paid for from the Treasury.

*Rule 12. Publication of Names of Members:* The Treasurer shall furnish with his annual report an alphabetical list of the names of the members from whom he has received money for dues and certificates during the financial year, for publication in the Proceedings.

*Rule 13. Merging of Balances:* All balances remaining from appropriations at the close of each fiscal year shall be turned back into the treasury, unless otherwise ordered by the Council.

*Rule 14. Committee on Invested Savings and Trust Funds:* The Chairman of the Council is instructed to appoint three members of the Association who, together with the Treasurer, shall be known as the Committee on Invested, Savings and Trust Funds.

Of the three members first appointed, one shall be appointed for one year, one for two years and one for three years. Each year thereafter, one member shall be appointed for three years. Members of the committee need not be members of the Council.

It shall be the duty of said committee to carefully consider the nature and status of all invested, savings and trust funds of the Association, and to make an annual written report upon the same to the Council, which report shall be read (in full) at one of the general sessions of the annual convention of the Association, and published (in full) in the annual volume of Proceedings thereof.

The present custody of the funds shall not be affected by the adoption of these resolutions, neither shall the committee have the power to invest or re-invest any of such funds, except as instructed by the Council or Association.



## THE FUNDS OF THE AMERICAN PHARMACEUTICAL ASSOCIATION

At the San Francisco meeting in 1889, the Permanent Secretary was directed to publish annually, in the Proceedings, a brief history of the origin, money value, and use to which each Fund may be applied.

There are seven permanent Funds at the present time, three of which are invested in Massachusetts State bonds, in the name of the Treasurer of the American Pharmaceutical Association.

### THE LIFE MEMBERSHIP FUND.

The Constitution, as originally adopted in 1852, and up to the year 1856, contained no provision for life membership or for the creation of a permanent fund. In the year named a revised Constitution was reported by a committee, and after consideration, adopted (see Proceedings, 1856, pp. 12, 14, 27 and 79). Article II, Section 7 (afterwards Section 8), containing the following provision:

"Members who have paid their annual contribution for ten successive years shall be considered life members, and exempt from their yearly payments, and entitled to a certificate to that effect."

Owing to increased expenditures for the publication of the Proceedings, etc., the Association found it necessary in 1867 (Proceedings, p. 75) to increase its revenue, one of the measures being the erasing of Section 8, and the total abandonment of life membership in the future.

In 1870 a revised Constitution was adopted (see Proceedings, 1870, pp. 87-96) and this, with a few slight amendments adopted in 1896 and 1900, is in force at the present time, containing the following:

"Article IV. All moneys received from life membership, together with such funds as may be bequeathed, or otherwise donated to the Association, shall be invested by the Treasurer in United States Government or State securities, *the interest of which for any current year only may be used by the Association for its expenses.*"

Chapter VI, Article 5, of the By-Laws adopted the same year, reads as follows:

"Any member who shall pay to the Treasurer the sum of *seventy-five dollars at a time* shall become a life member, and shall be exempt from all future annual contributions."

This article was amended in 1888 and 1896 and again in 1906 and changed to Article IV, Chapter VIII. As now in force, it reads as follows:

"Any member of the Association who shall pay to the Treasurer the sum of \$100.00 during the first year of his connection therewith, and also any member not in arrears, who after ten years shall pay the sum of \$75.00, or after fifteen years the sum of \$50.00, or after twenty years the sum of \$40.00, or after twenty-five years the sum of \$25.00, and any member who may have paid annual dues for thirty-seven consecutive years, shall become a life member, and shall be exempt from all future annual contributions."

In the roll of members for the year 1872 (p. 338) the name of the late Charles W. Badger, of Newark, N. J., appears for the first time as a life member, and the only one until the time of his death in 1877, under this provision, which was

subsequently modified (Proceedings, 1879, p. 799) so as to reduce the sum to be paid into the treasury by those who had been members for from five to twenty years. In the same year the published roll contained the names of two new life members. The article on life membership was further modified in 1883 (Proceedings, p. 52), again in 1896 (Proceedings, p. 17), and again in 1906 (Proceedings, p. 100), so as to apply to those who have been members for over twenty years (see Chapter VIII, Article IV, of the By-Laws). Under this clause the life membership (new style) of the present roll is ninety-eight, as published in the Proceedings.

The Treasurer's report for 1880 (p. 524) states the life membership fund to be \$75, for 1881 (p. 513) \$613, for 1882 (p. 608) \$685, for 1883 (p. 436) \$904.38, and for 1884 (p. 524) \$944.14. At the Milwaukee meeting, held in the same year, the Association directed (Proceedings, p. 525) that \$316, which amount had been in past years donated to the funds of the Association by various members, be withdrawn from the general fund to be added to the Life Membership Fund. At the Providence meeting in 1886 (Proceedings, p. 147) it was recommended by the Finance Committee, and approved by the Council and by the Association, that the sum of \$3,000 be transferred from the general fund to the Life Membership Fund. At the Cincinnati meeting in 1887 (Proceedings, p. 471) the Association ordered again a transfer to the same fund of \$4,000.

Since 1887 the annual reports of the Chairman of the Council give the number of each bond of the registered securities in which the Life Membership Fund is invested. By vote of the Association, the name of this fund was changed to the William Procter, Jr., Fund on September 15, 1902 (see Proceedings, 1902, p. 214), but was changed back to its original name, Life Membership Fund, on September 5, 1906 (see Proceedings, 1906, p. 100). The report of the Treasurer on the special funds of the Association, contained in the addendum to his annual report, shows that on January 1, 1915, the value of the Life Membership Fund was \$20,363.05 (face value of securities only given), *of which sum the interest for any current year only may be used by the Association for its expenses.*

#### THE EBERT PRIZE FUND.

At the Richmond meeting in 1873 (Proceedings, p. 58), Mr. Albert E. Ebert presented to the Association the sum of five hundred dollars, to be used in the following manner:

"The money to be properly invested by order of the Executive Committee, and the annual interest derived therefrom to be appropriated for *conferring a suitable prize* for the best essay or written contribution containing AN ORIGINAL INVESTIGATION OF A MEDICINAL SUBSTANCE, determining new properties, or containing other meritorious contributions to knowledge; or for IMPROVED METHODS of determining merit, for the preparation of chemical or pharmaceutical products; the prize to be awarded by a suitable committee within six months after the annual meeting at which the essays are presented for competition, *provided*, that in case no one of the essays offered is of sufficient merit to justify the award, in the judgment of the Committee on Prize Essays, all may be rejected, and the sum added to that of the Fund."

The offer was accepted by the Association, and by a special vote (*Ibid.*, p. 70) the fund was ordered to be called the *Ebert Fund*, and the prize awarded from the proceeds to be known as the *Ebert Prize*.

The Ebert Prize was awarded for the year 1874 to Charles L. Mitchell, for 1877, to Fred B. Power; for 1882, to John U. Lloyd; for 1886, to Emilen Painter;

for 1887, to Edward Kremers; for 1888, to Jos. F. Geisler; for 1890, to Wm. T. Wenzell; for 1891, to John U. Lloyd; for 1897, to Albert B. Prescott and Jas. W. T. Knox; for 1898, to Virgil Coblenz; for 1899, to Henry Kraemer; for 1900, to Edward Kremers and Oswald Schreiner; for 1902, to J. O. Schlotterbeck and H. C. Watkins; for 1903, to Fred B. Power; for 1905, to Dr. Ernst Schmidt, of Germany; for 1906, to J. O. Schlotterbeck and H. C. Watkins; for 1907, to Fred B. Power and Frank Tutin; for 1908, to A. B. Stevens and L. E. Warren; for 1909, to Henry Kraemer; for 1910, to Harry M. Gordin; for 1911, to W. A. Puckner and L. E. Warren.

The Ebert Fund amounted in 1883 (Proceedings, p. 436) to \$683.43. Since 1887 the reports of the Chairman of the Council specify the securities in which this fund is invested. On January 1, 1915, its reported value was \$1,081.38 (face value of securities only given). *The annual interest must be applied to a prize for an original investigation meeting the requirements stated above.*

In accordance with the recommendation of the committee on invested savings and trust funds, submitted and adopted at the fifty-eighth annual meeting (see Proceedings), 1910, p. 454, the name of the Ebert Fund was changed to Ebert Prize Fund, and the amount of the prize limited to \$25.00 until the excess of interest above the sum annually awarded and added to the principal shall amount to \$1,000.00, after which the entire annual interest upon the same shall constitute the Ebert Prize.

#### THE CENTENNIAL FUND.

After the meeting held in Philadelphia in 1876, the local committees, on settling all accounts for the entertainment of the Association, had an unexpended balance left, which by subsequent collections made in Philadelphia was increased to \$525. At the Toronto meeting in 1877 (Proceedings, p. 481), Dr. A. W. Miller, local secretary for 1876, presented this sum in the name of the local committees to the Association, with this condition, "that a like amount be subscribed by the members within one year," with a view of establishing a fund to *aid in the prosecution of original investigations*, the interest accruing from the investment of the fund to be devoted to the defraying of expenses actually incurred by members in conducting investigations in some branch of science connected with pharmacy. The Association accepted the conditions (*Ibid.*, pp. 526-528), and adopted the name *Centennial Fund*.

The collection of a like amount by the Association was completed at the Saratoga meeting (Proceedings, 1880, p. 553) when \$582.81 had thus been received. In the following year a committee of the Centennial Fund was provided for in the By-Laws of the Council, Chapter VII (Proceedings, 1881, pp. 190, 549). Members have not availed themselves of this fund to the extent contemplated at its foundation; for the amounts paid out have been only \$7.50 to Robt. B. Warder for material used for investigations reported in 1885; \$96.80 used by the Committee on National Formulary during the years 1886 and 1887 (Proceedings, 1889, p. 16); and \$32 to Edward Kremers for material necessary for the prosecution of scientific research on the menthol group, reported in the Proceedings for 1892; \$50 to the same investigator in 1893, and \$50 again to the same investigator in 1894. In 1896 the sum of \$22.33 was paid to the Committee on Indicators for material used in their investigations.

The original sum of \$1107.81 (\$525 + \$582.81) had increased in 1883 to \$1232.76. Since 1887 the securities in which the fund is invested are specified in the reports of the Chairman of the Council; the reported value was \$2,836.35 (face value of securities only given) on January 1, 1915. *The interest accruing*



*from this Fund is to be used for defraying the expenses incurred in conducting original investigations in pharmacy or an allied science.*

## THE ENDOWMENT FUND.

At the fifty-fourth annual meeting, held at Indianapolis, Ind., September, 1906, Messrs. Samuel A. D. Sheppard and James H. Beal proposed the establishment of a permanent fund to be known as the "Endowment Fund" (see Proceedings, 1906, p. 99) under the following conditions:

"That the said S. A. D. Sheppard and J. H. Beal jointly agree to pay into said fund one dollar for each twenty dollars contributed and paid into said fund by all other members of this Association up to and until such Endowment Fund shall, with its accumulations of interest, reach the sum of twenty-five thousand (\$25,000) dollars.

"That as moneys shall be received as additions to said fund the same shall be invested in such securities as the Council may direct until the interest and other accumulations, together with the amount of the principal, shall reach the sum of twenty-five thousand (\$25,000) dollars.

"That when the Endowment Fund shall have reached the sum of twenty five thousand (\$25,000) dollars one-half the income derived therefrom may be used for any purpose deemed wise by the Association.

"That when said Endowment Fund, inclusive of donations, interest and other accumulations, shall amount to the sum of fifty thousand (\$50,000) dollars, the Association may use ninety per cent. of the income therefrom for any purpose deemed wise by the Association.

"That under no circumstances whatever shall all the income from said fund be used, but at least ten per cent. thereof shall be annually added to the principal of the Endowment Fund.

"That under no circumstances whatever shall the principal or any part thereof be used for any purpose except investment for income, nor pledged for any debt or obligation of the Association, or any person, nor used for any other purpose or in any other manner than as specified."

Contributions to the Endowment Fund have been made at different times, and the names of the contributors published in the annual volume of Proceedings (see Proc., 1907, pp. 47 and 48; Proc., 1908, pp. 476 and 477; Proc., 1909, p. 464; Proc., 1910, p. 478). According to the Treasurer's report, the total amount contributed and accumulations up to January 1, 1915, was \$6,063.51.

## THE GENERAL FUND.

On February 26, 1909, the Council directed that \$5,000.00 of the current funds of the Association be invested by the Treasurer in some interest-bearing security, to be approved by the Finance Committee and the Chairman of the Council (see Proc., 1909, p. 449). In accordance with this order the Treasurer reported on May 26, 1909, having purchased five \$1,000.00 St. Louis, Mo., 4 per cent. bonds at 103<sup>5</sup>/<sub>8</sub> and accrued interest. Again, on November 15, 1909, the treasurer, in accordance with an order of the Council (see Motion No. 11, page 449) invested \$5,000.00 of the current funds of the Association in St. Louis public buildings and public works 4 per cent. gold bonds. All of these bonds are registered in the name of the Treasurer of the A. Ph. A. and are kept in the Association's safe-deposit box.

## THE WM. PROCTER, JR., MONUMENT FUND.

At the fifty-second annual meeting held at Kansas City, Mo., September, 1904, it was resolved to solicit subscriptions for a memorial monument to be

erected in the Smithsonian Grounds at Washington, D. C., to the memory of William Procter, Jr., if possible in 1917, the centennial anniversary of his birth. A committee was appointed to take the matter in charge, which since that time has been active in soliciting subscriptions. The names of contributors have been published from time to time in the annual volume of Proceedings (see Proc., 1906, p. 63; Proc., 1907, p. 98).

In September, 1907, at the annual meeting held in New York City, the Association directed that all moneys collected for the William Procter, Jr., Monument Fund be turned over to the Treasurer of the A. Ph. A. to be deposited on interest for the benefit of said fund (see Proc., 1907, p. 99). The Treasurer of the A. Ph. A., in his annual report for 1908-1909, reports having received on January 27, 1909, the sum of \$3,413.33 from the Treasurer of the Committee, Benj. T. Fairchild, which was placed on time deposit in the International Bank of St. Louis, Mo., for a period of twelve months at 4 per cent. annum (see Proc., 1909, p. 472). The total sum to the credit of this fund, including interest on time deposits, according to the treasurer's report on January 1, 1915, amounted to \$7,473.90.

#### THE EBERT LEGACY FUND.

The late Albert E. Ebert having by his will designated the A. Ph. A. as residuary legatee of his estate, it was ordered at the fifty-eighth annual meeting, on recommendation of the Committee on Invested Savings and Trust Funds, that the money received from the estate be converted into a fund to be known as the Ebert Legacy Fund, and that this fund be invested in municipal or other public bonds approved by the Committee on Invested Savings and Trust Funds and the Finance Committee, and that this fund be kept intact and the income added thereto until the fund and its accumulations shall together amount to a total of \$10,000.00.

When this sum has been reached, the income derived from the fund shall be devoted to such purposes as will in the opinion of the Council best commemorate the founder of the fund and his services to pharmacy.

The reason for the suggestion that the Ebert Fund and the Ebert Legacy Fund be kept separate was, that the first was given by Mr. Ebert for a specific purpose, while the latter was given to the Association practically without restriction and with the evident intention that the Association should use it in the manner which it deemed best.

On December 14, 1909, the executors of the Ebert estate paid over to the Treasurer of the A. Ph. A. the sum of \$2,800.00, which has been deposited in bank at interest. The Treasurer's report states that January 1, 1915, this fund amounted to \$3,290.42.

#### THE COLLEGE PRIZE FUND (MOTTER FUND).

On the 4th of August, 1905, Dr. Murray Galt Motter, of Washington, D. C., placed in the treasury of the American Pharmaceutical Association the sum of \$25.00, the same to be awarded as prizes by the National College of Pharmacy to the members of the classes of 1906-1907-1908-1909-1910 of said College.

This money, deposited in the Boston Penny Savings Bank in the name of the Treasurer of the A. Ph. A. is held as a special fund, to be drawn upon as the prize students shall be named by the National College of Pharmacy and their applications for membership in the American Pharmaceutical Association shall be approved.

Up to the present time no demands have been made on the Fund. Jan. 1, 1915, the Fund amounted to \$35.54.



## RICE MEMORIAL FUND.

A joint committee was appointed by the Chairman of the Committee of Revision of the U. S. P., on June 26, 1901, to report to the Board of Trustees and Committee of Revision upon a suitable plan for honoring the memory of Dr. Charles Rice.

It was decided, after hearing the report of the committee, to erect a monument over Dr. Charles Rice's grave and to prepare a memoir containing a biographical sketch of his life.

The monument over the grave was dedicated July 7, 1903, with the members of the Board of Trustees among those present. The memoir, a volume of sixty-four pages, was published and distributed in 1904.

March 22, 1905 (see Item No. 428 in Abstract of Minutes of Board of Trustees 1900-1910), on motion by Dr. H. C. Wood, the balance of the Rice Memorial Fund was accepted as voted by the Revision Committee and the Chairman was requested to appoint a committee of one, to be known as the Rice Memorial Committee, to take charge of this fund and deposit it in the name of the Board of Trustees of the U. S. P. Convention. This motion was carried and the chairman appointed Mr. S. A. D. Sheppard to constitute the committee.

Under date of November 22, 1910, Dr. A. R. L. Dohme, representing his father, Dr. Charles E. Dohme, the retiring chairman of the Board of Trustees, turned over to Chairman James H. Beal, of the present Board, bank-book No. 55828, of the Boston Penny Savings Bank, with an account, amounting to one hundred and forty-nine dollars and forty-three cents (\$149.43) to its credit on October 1, 1910, the same standing in the name of Samuel A. D. Sheppard, Committee of Trustees of the United States Pharmacopoeial Convention.

June 6, 1913. The Board of Trustees of the U. S. P. C. inquired of the A. Ph. A. whether the organization would accept the custodianship of the Rice Memorial Fund (U. S. P. C. Board of Trustees minutes, Item 488, page 365). The Council of the A. Ph. A. voted to accept the Fund in trust.

The transfer was made November 22, 1913, the amount being \$168.21.

January 1, 1915, it amounted to \$170.91.

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# **REPORT**

ON THE

# **PROGRESS OF PHARMACY**

## **1913**

**By C. LEWIS DIEHL**

WITH THE COLLABORATION OF

**HARRY V. ARNY**

**LINWOOD A. BROWN**

**ERNEST C. MARSHALL**

**OTTO RAUBENHEIMER**

**CLYDE M. SNOW**

**MARTIN I. WILBERT**

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## **INTRODUCTORY**

Submitting herewith the Report on the Progress of Pharmacy for the year 1913, this will probably not exceed the limit of space assigned to it in the Year Book, notwithstanding that it contains a larger number of abstracts than the Report of 1912, many of them being of a character permitting a comparatively small space without detracting from their value as items of practical information. This is particularly true of an increased number of pharmacological subjects which one of my collaborators has abstracted from the "Journal of the American Medical Association," in the belief that these, heretofore neglected, will prove valuable to the practical pharmacist on subjects that, although appealing more pertinently to medical practitioners, should be conveniently accessible to the modern pharmacist.

It should be mentioned also that this innovation has necessitated some slight changes in the systematic arrangement of the Report, some of the subjects heretofore considered under the heading of "Albuminoids," in the Section on Organic Chemistry, being now included under the general heading of "Animal Drugs" in the Section on Materia Medica, while the subjects embodied in the chapter on Albuminoids have been classified under a number of sub-headings, so as to bring kindred subjects into close context.

Attention is also directed to an

## ADDENDUM

which has become necessary to effectively complete the present Report. For reasons which it would serve no good purpose to explain, except to say that none of the gentlemen mentioned as my collaborators are either directly or indirectly responsible, I have been compelled to make the abstracts from a number of important American journals at the last moment, too late for inclusion in the regular text, which had been completed and arranged for the printer.

These abstracts are, therefore, given in the form of an "Addendum" following the usual Report, classified under the same general headings, or divisions, but under these alphabetically arranged according to subjects; and it is believed that these, with the abstracts supplied by one of my collaborators to whom a certain number of journals had been assigned, will fairly represent the original articles that have been communicated by their authors to the American journals during the year 1913.

C. LEWIS DIEHL,

Reporter in the Progress of Pharmacy.

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## PHARMACY

### A—GENERAL SUBJECTS

**History of Pharmacy.**—Reutter writes of the foundation during the early part of 1913 of a French Society for the History of Pharmacy, under the presidency of M. Gauthier, director of the Paris School of Pharmacy. The secretary is Dr. Dorveaux who is about to publish a French translation of the "Circa Instans" of Plateario, under the title of "Le livre des simple Medicines." The rest of Dr. Reutter's paper discusses some of the topics considered at the meetings of the historical society.—Schweiz. Wschr. f. Chem. u. Pharm., 51 (1913), No. 18, 256. (H. V. A.)

**International Pharmacopœial Bureau.**—Tschirch, after expressing regret over the waste of mental energy as evidenced by the fact that the pharmacists and physicians in a dozen or more leading countries are practically duplicating work on the pharmacopœial commissions of each country, and after strongly recommending the Hygienic Laboratory "Digest of Criticisms" as an important step toward preventing waste of energy in the bibliographical field, urges the organization of an international pharmacopœial



bureau, aimed (a) to prepare pharmacopœial bibliography and that as complete as possible, and published in at least the three leading languages, and (b) to arrange the establishment of a research laboratory where continuous work on pharmacopœial problems can be carried on.—Schweiz. Wschr. f. Chem. u. Pharm., 51 (1913), No. 16, 225. (H. V. A.)

**An International Pharmacopœial Bureau.**—Professor Tschirch, in an address before the Swiss Apothecaries' Society, discusses his project of an international pharmacopœial bureau. After giving a historical outline of efforts toward preparing an international pharmacopœia he describes the work of the Brussels International Conference for Unification of Heroic Medicines held in 1902, and the results of this Conference. He speaks of the election, at the Conference, of an international secretary to codify pharmacopœias and the support given the plan by the Belgian government, as well as by the other organizations represented at the Conference and sharply criticizes the inactivity of this branch of pharmacopœial work. He then outlines his own plan of an international pharmacopœial bureau at Berne and urges the Swiss Apothecaries' Society to ask the Swiss Government to invite the interested nations to a conference at Berne at which plans of organization of the pharmacopœial bureau will be formulated.—Schweiz. Wschr. f. Chem. u. Pharm., 51 (1913), Nos. 48 and 49, 729 and 744. (H. V. A.)

**Digest of Comments on the Pharmacopœia of the United States of America.**—A book review of Hyg. Lab. Bull. No. 87 says in part: "In the period covered by this, the seventh in the series of 'Digests,' the critical character of the comments on the German Pharmacopœia might be taken to indicate that the makers of pharmacopœias must in the future cater to a more and more discriminating constituency. This attitude on the part of users of pharmacopœias is still further emphasized by the growing demand for a limited materia medica and, by inference, the limitation of the scope of the Pharmacopœia to substances of recognized therapeutic efficacy and substances which, to some degree at least, lend themselves to adequate standardization, whether chemical or physiologic.—J. Am. M. Assoc., 1913, v. 61, 2005. (M. I. W.)

**U. S. Pharmacopœia IX.**—*Additions and Deletions.*—Oliver T. Osborne, referring to the U. S. P. IX, mentions that 158 drugs and preparations were deleted by the Subcommittee on Scope.



Seventy-nine of these deletions, just half, were voted in by the Executive Committee in spite of this averse recommendation, and it will be remembered that the only member of the Executive Committee practicing at the bedside had already voted once in the Subcommittee on Scope, and had himself dissolved, favorably to admission in the subcommittee sixty-five tied votes. The Executive Committee also exercised its prerogative rather discourteously to the Subcommittee on Scope by approving a number of drugs and preparations that had not even come before the subcommittee.—J. Am. M. Assoc., v. 60, 2039. (M. I. W.)

**Pharmacopœia Scope.**—Oliver T. Osborne makes some observations on the absurdities and the commercialism of the proposed ninth decennial revision of the United States Pharmacopœia and expresses the belief that the word standards is much overworked and is used as a cloak or covering for all sorts of arguments and all kinds of defenses by those who desire a large pharmacopœia.—J. Am. M. Assoc., v. 60, 2038-2042. (M. I. W.)

**Pharmacopœia Scope.**—The House of Delegates of the American Medical Association endorsed the following resolution:

WHEREAS, It is desirable that the articles officialized by the Pharmacopœia of the United States should reflect the progress of therapeutics, and

WHEREAS, Therefore the inclusion of articles in the Pharmacopœia now in progress of revision should be determined by their therapeutic merit; and

WHEREAS, The decision of therapeutic questions should logically and in fairness be left mainly to the medical members of the Revision Committee; therefore, be it

*Resolved*, That the section request the House of Delegates of the American Medical Association to urge on the Committee of Revision of the Pharmacopœia of the United States that the selection of articles to be included be left to the Committee on Scope, in which the medical profession has a majority representation, rather than to the Executive Committee, which represents mainly the pharmaceutical profession, and which has overridden half the changes advocated by the Committee on Scope.—J. Am. M. Assoc., v. 60, 2086. (M. I. W.)

**U. S. Pharmacopœia. Shortcomings.**—Alexander S. von Mansfeld observes: "I am a little bit impatient of the shortcomings of the Pharmacopœia of the United States, and yet I am proud

to say that I was one of three men who insisted on the standardizing of the Pharmacopœia. When the bill was passed, I was chairman of the Committee on Pure Foods of the American Medical Association. Now let us by all means not forget the main point at issue. We have a commentary; and whatever the little new volume is named it will make up the defects of the Pharmacopœia."—J. Am. M. Assoc., 1913, v. 61, 8. (M. I. W.)

**Galenicals Made during Fifty Years.**—C. Bührer publishes an interesting paper on the fifty-year record of a druggist in Lausanne in the manufacture of galenicals. During that period there was made for the use of the pharmacy 15,800 bottles of purgative lemonade, 135 kilograms of Blaud's pills, 750 kilos of solution of lead subacetate, 350 kilos of ointment of boric acid, 2265 liters of wine of cinchona and 14 tons of simple syrup. The records of many old and almost forgotten preparations—such as *conserve cynosbati* and *electuarium catholicum*—are included in the list.—Schweiz. Wschr. f. Chem. u. Pharm. 51 (1913), No. 46, 696. (H. V. A.)

**Manufacture of Galenicals.**—*Laboratory Equipment Suitable for the Retail Pharmacist.*—In a paper read before the Philadelphia Branch A. Ph. A., Professor E. Fullerton Cook interestingly outlines the various operations that are required in carrying out the manufacture of galenicals by the retail pharmacist, briefly enumerates the apparatus and describes the apparatus and utensils suitable for a pharmaceutical laboratory properly equipped for this purpose. Such an equipment, for thoroughly satisfactory work, is not large, and when all has been summarized its greatest importance is the calibre of the man who will do the work, and this part of the equipment is frequently awaiting only the word of encouragement and the direction to go ahead. —Journ. Am. Ph. A., August, 1913, 1156–1160.

**Galenical Preparations.**—*Manufacture by the Pharmacist.*—A companion paper to the preceding is that of Robert P. Fischelis, which was read at the same meeting, in which the economic advantages in the manufacture of galenicals by the retail pharmacist are very clearly pointed out. Mr. Fischelis shows in this admirable paper that "real" pharmacy can be practiced to commercial advantage, and gives proof of this fact by submitting the statistics made by men who are actually engaged in the practice of pharmacy. Furthermore, he points out how preparations made in the store can be disposed of to commercial advantage, and that just as

soon as the pharmacists as a whole will realize that in order to make the professional side of their calling pay, they must practice "real" pharmacy and let the physician know that they are practicing "real" pharmacy, just so soon will pharmacy come into its own.—*Journ. Am. Ph. A.*, August, 1913, 1161–1164.

**Galanical Preparations.**—*Necessity of Tests.*—R. Richter calls attention that some of the cheap galanical preparations in the market are prepared with a menstruum containing less alcohol than is prescribed by the *Pharmacopœia*. He quotes several instances, one for instance when tincture of valerian was prepared with 40% alcohol instead of 68% alcohol.

F. R. Schwikkard also calls attention for the necessity of creating standards and tests for the fluidextracts of the *Pharmacopœia*. It is desirable that the monographs on galanical preparations should contain specific gravity, alcohol content, percentage of alkaloids, dry residue and ash.—*Pharm. Ztg.*, 1913, Nos. 31 and 37, 307–309 and 368–369. (O. R.)

**Galanical Preparations.**—*Refractometrical Examination.*—Rudolf Meyer has subjected a large number of liquid and dissolved medicaments to refractometrical examination, with results which have demonstrated the value of the method for the examination of galanical preparations for which so far no systematic method of valuation exists. The figures obtained justify the author's conclusions that the refractometrical results are quite as sharply defined and quite as reliable as are those obtained with the polariscope, which have already been admitted to use.—*Apoth. Ztg.*, xxviii (1913), No. 81, 810–812.

**German Pharmacopœia.**—*Tests.*—Richter and Wiebelitz give a great many methods for use in the application of tests in the German *Pharmacopœia*. They enumerate the necessary utensils and apparatus and demonstrate how the different tests can be applied in a quick and systematic manner.—*Apoth. Ztg.*, 1913, Nos. 2 and 6, 18–20 and 50–51. (O. R.)

**The Scientific Pharmacist.**—Mr. Herman Nestor argues the commercial success of the scientific pharmacist through various lines of effort. The rural pharmacist, he says, has an unparalleled chance to display scientific ability in analyzing soils, and in dairy-chemical problems, etc. Bacteriology, botany and the cultivation of drugs are studies he recommends to the pharmacist to lift himself and his profession to a higher plane, and to bring also financial reward.—*Proc. Texas Phar. Assn.*, 1913, 94–95. (E. C. M.)

**Professional Side Lines.**—Under this title Hugh Craig suggests that pharmacists may find both profit and usefulness in many fields of work, just outside the bounds of legitimate pharmacy. He suggests to them the study of physiological chemistry and the establishment of a biological laboratory for the preparation and examination of biologic products, analyses of blood, sputum, food and water. Agricultural chemistry, he suggests, has also many problems waiting those competent to solve them. He gives a list of books useful in the work he outlines, and also details the equipment needed for a physiological laboratory suitable for a pharmacist.—Proc. Cal. Phar. Assn., 1913, 69-71. (E. C. M.)

**Commercial Pharmacy.**—F. M. Siggins, Ph.G., contributes an interesting paper, with suggestions of changes in the methods of education in Colleges of Pharmacy and the addition of a more practical instruction.—Proc. Penn. Phar. Assn., 1913, 213-217. (E. C. M.)

**Prescribing Names.**—Manufacturers frequently take a mixture of little-known and therapeutically worthless drugs, add some valuable and well-known drug and market it in such a way as to lead the thoughtless to imagine that the therapeutic virtues are due to the little-known ingredients, made prominent frequently by being included in the title of the mixture. Herein lies one of the vicious phases of the nostrum evil.—J. Am. M. Assoc., v. 60, 526. (M. I. W.)

**Deteriorated Pharmaceutical Preparations.**—M. I. Wilbert presents the following table showing number of samples of six simple pharmaceutical preparations reported on by state and other chemists during the years 1907-1911, inclusive:

	Number of Samples.		Approximate Percentages.
	Examined.	Rejected.	
Lime water.....	1,231	605	50
Solution of potassium arsenite.....	317	221	70
Spirit of peppermint.....	809	518	60
Tincture of iodine.....	5,959	2,388	40
Tincture of opium.....	597	270	50
Tincture of nux vomica.....	279	83	30
Total number of samples.....	9,192	4,085	45

J. Am. M. Assoc., 1913, v. 61, 190. (M. I. W.)



**The Swiss Association of Abstaining Apothecaries.**—This interesting organization makes an appeal for membership not only among the Swiss apothecaries, but also invites foreign membership, the latter with the hope that an international organization may eventually be consummated.—*Schweiz. Wschr. f. Chem. u. Pharm.*, 51 (1913), No. 2, 26. (H. V. A.)

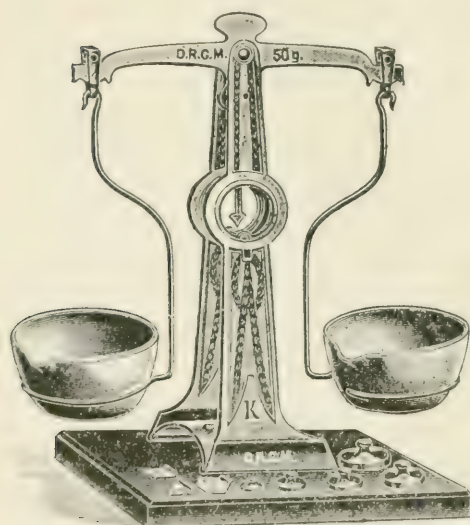
## B.—APPARATUS AND MANIPULATION

### WEIGHT, MEASURE, SPECIFIC GRAVITY.

**Dispensing Balance.**—*A New and Precise Form.*—A new and very accurate balance, designed to replace the hand balance com-

monly used at the dispensing counter for weighing powders, but otherwise useful for a variety of prescription work, is shown by Fig. 1. It is constructed of brass or aluminium and is mounted on a metallic base or on a plate of black glass. The scale pans, which are constructed of horn or aluminium, are supplied in a variety of interchangeable forms, lipped, with handles, deep or shallow, to facilitate the general utility of the balance, which

FIG. 1.



Dispensing Balance.

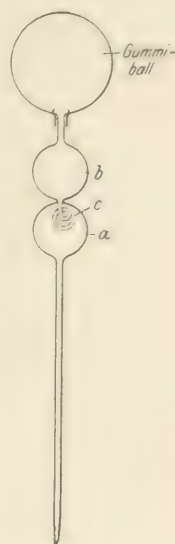
is moreover an instrument of precision. The balance is supplied by the Akt.-Ges. für pharm. Bedarfsartikel vorm. Georg Wenderoth, Cassel.—*Pharm. Ztg.*, lviii (1913), No. 43, 426.

**Safety-Pipette.**—*Construction for Bacteriological Work.*—A new safety-pipette for bacteriological work has been devised and is exploited by the "Medizinschen Warenhaus," Berlin N. W. As shown by Fig. 2 it consists of a glass tube surmounted by two globular expansions, *a* and *b*, which are not directly united with each other, but by means of a small, s-shaped tube, *c*, reaching



from *b* into *a*. The whole is surmounted by a rubber ball made of "duritgum," which serves for sucking the bacterial fluid into the pipette. This construction and the method of its use prevents passage of bacterial fluids beyond the upper glass expansion and into the ball, and effectively protects the operator from infection during bacteriological examinations.—Pharm. Ztg., lviii (1913), No. 103–104, 1035.

FIG. 2.



Safety Pipette.

**Filtering Pipette.**—*A Simple Contrivance.*—

O. Anselmino directs attention to a simple contrivance which is attached to pipettes intended to withdraw fluids in which precipitates are contained and partially suspended. It consists of a small, hollow glass ball, accurately

FIG. 3. fitted by grinding to the somewhat



thickened point of the pipette, provided with numerous small perforations and filled with a pledget of absorbent cotton, through which the liquid is filtered clear by suction to a point above the mark. The ball is then removed, and the contents of the pipette adjusted to the mark in the usual way. The contrivance is shown in the accompanying drawing (Fig. 3) fitted to the pipette, and is supplied by Warmbrunn, Quilitz & Co., Berlin. Pharm. Ztg., lviii (1913), No. 94, 939.

**Medicine Dropper.**—*Normal.*—According to physics, the number of drops delivered by a medicine dropper depends upon the orifice, the consistence of the liquid, the temperature and several other important factors. According to the Brussels protocol, a normal medicine dropper has been created, which delivers 20 drops of distilled water at 15° C. to 1 Gm. Apothecary F. Eschbaum finds that 1 Gm. of the tabulated liquids will give the stated amount of drops when delivered by the normal medicine dropper.

Official solutions .....	17–45 drops
Fatty and ethereal oils .....	40–53 drops
Tinctures .....	45–63 drops
Acetic ether .....	35 drops
Chloroform .....	53 drops
Spirit of ether .....	65 drops
Ether .....	84 drops

It can be readily seen that, as a rule, the number of drops to 1 Gm. will increase as the specific gravity of the liquid will decrease. The normal medicine dropper has come into extensive use throughout Europe and it is to be hoped that it will also be adopted in the United States.—Suedd. Ap. Ztg., 1913, No. 93. (O. R.)

**Medicine Droppers.**—*Causes of Inaccuracy.*—W. Beckers reports the results of an interesting investigation of the causes that determine the inaccuracy of "drop-medication." Although overlooking the fact that the normal dropper adopted by the Brussels Conference, which is based on the delivery of 20 drops to produce 1 Gm., refers to water only, and that consequently the weight of 20 drops of other liquids (such as fixed and volatile oils, for example) depends upon their specific weight, he finds that the size of drops, whether delivered by an accurate normal dropper or from ordinary pipettes and dropping vessels, varies according to the position in which the dropper is held, whether this is vertical or horizontal, and also the greater or less volume of liquid in the container from which the drops are delivered. The author shows in a series of tables covering the results of his investigations that in general the drop-glasses supplied are quite inaccurate and suggests that so long as practical accuracy is not attained in their manufacture, potent medicines should never be administered by drop-dosage, but preferably in form of powders or pills.—Pharm. Ztg., lviii (1913), No. 16, 156; from Berl. klin. Wschr., 1913, No. 5.

**Drop-Glass.**—*A Convenient Form for Analytical Operations.*

—Dr. O. Rudolph has devised and recommends the drop-glass shown by Figs. 4 and 5 which is

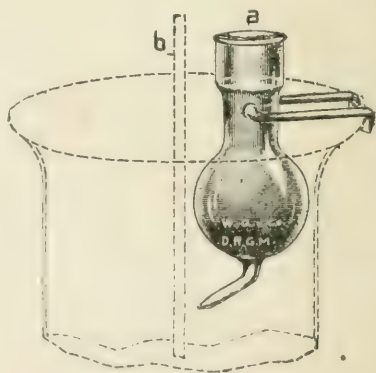
FIG. 4.



intended for convenient use in analytical precipitations when a large number are to be

made with the same precipitant. The drop-glass has a capacity of 10 Cc. and when not in actual use may be laid on the operating

FIG. 5.

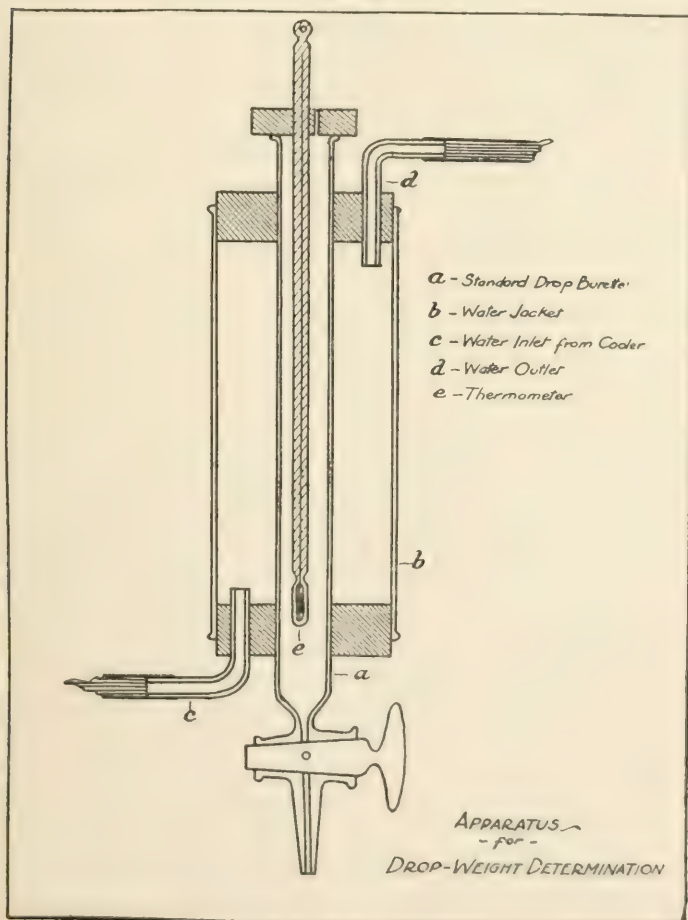


Drop-Glass.

table in the position shown by Fig. 4. In use, it is suspended on the rim of the beaker, as shown by Fig. 5, when the precipitant is delivered drop by drop into the liquid under examination. Obviously, the drop-glass may be used by hand and laid aside as required without danger of its contents spilling. The apparatus is supplied by Warmbrunn, Quilitz & Co., Berlin.—Pharm. Ztg., lviii (1913), No. 34, 338; from Chem. Ztg., 1913, No. 42.

**Drop Weights.**—*Convenient Apparatus for Determinations.*—Curt P. Wimmer and Leo Roön observe that a number of so-called normal droppers, all of them constructed to conform with the

FIG. 6.



Drop Weights.

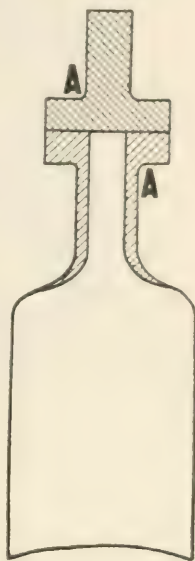
requirements of the Brussels Conference, are on the market. Such are, for example, the Eschbaum Normal Dropper, the Lamprecht Patent Dropping Flask, the Viginta Drop Glass of Steinbuch, and others. Having occasion to determine the weight of a certain number of drops of a liquid, it occurred to the authors that a burette might readily be constructed and used to deliver the 20 drops of distilled water at  $15^{\circ}$  C. to weigh one gram. The firm of Greiner & Co. furnished a burette according to their directions—20 Cc. burette accurately graduated in tenths, 3 Mm. in diameter for dropping surface delivering 20 drops of water to weigh one gram at  $15^{\circ}$  C. Upon testing, the burette was found to be exact, provided a certain rate of dropping was maintained. The difference in weight of the drop due to a changed rate of dropping amounted to about 1 to 2 milligrams per drop. In order to maintain the temperature during the process of dropping, the burette was jacketed and water, cooled to  $15^{\circ}$  C., passed through it. A thermometer was suspended in the burette. The accompanying sketch (Fig. 6) illustrates the apparatus used. By means of this apparatus a large number of drop weights of the more common potent medicines were determined and were found in most instances to agree closely to those determined by Dr. Friedrich Eschbaum. A list of determinations which fully confirm the definite maxims advanced by Eschbaum relative to drop weights, is appended and should be consulted.—Journ. A. Ph. A., December, 1913, 1535–1537.

**Specific Gravity.**—*Method of Determination, Eliminating Enclosed Air in Powders.*—M. Billy obviates the well-known difficulty of completely eliminating the error due to minute quantities of adherent air, when powders are immersed in water or other fluid in order to determine their density, by first subjecting the powder to an atmosphere of carbon dioxide, and then immersing and weighing it in potassium hydroxide solution of about normal strength. A specially devised pyknometer, described in the original paper, may be used to shorten the process. It is stated that by this method the difference between the density of a substance in mass and in powder determined on the same balance is only 1 : 3000, which is the limit of error of the balance itself. By the ordinary method of weighing the powder in water, the ratio of error was ten times greater, 1 : 300; with the same balance.—Pharm. Journ. & Pharmacist, May 3, 1913, 629; from Compt. rend., 156 (1913), 1065.



**New Pyknometer.**—*An Improved Form for Ascertaining the Density of Solid Substances.*—John Johnston and L. H. Adams describe an improved form of pyknometer for determining the density of solid substances, with especial reference to permanent changes produced by high pressures. The essential feature of this new form, which is illustrated in Fig. 7, is the plane-ground joint, between the stopper and bottle. The neck is fairly thick, partly for the sake of strength, partly so as to minimize heat transfer when the bottle is held by the neck between the fingers. The two surfaces making up the ground joint should be *optically flat*, but not necessarily highly polished; and must be ground with care, as the success or failure of the bottle depends upon the excellence of the joint. As a criterion of the quality of the joint, the stopper should be pressed forcibly on to the bottle with a slight rotary motion; if the grinding has been carefully done, the bottle may be lifted by the stopper. In making this test the stopper should be dry, that is, without grease or lubrication of any kind. Another requisite of success is that the pyknometer should be made in such manner that no deep groove exists at A (see figure), or indeed that there be no recess from which excess of water cannot readily be wiped away. Pyknometers

FIG. 7.



New Pyknometer.

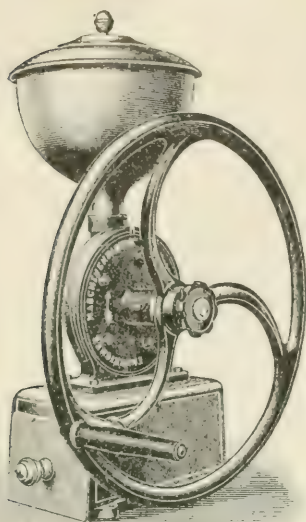
of this form have the following important advantages: (1) The loss in weight by evaporation of the pyknometer liquid is negligible (for water it is of the order of 1 Mgm. in twenty-four hours). (2) No grease or other lubricant is required on the joint. (3) Any small particles of grit or dirt which may accidentally lodge on the ground surfaces can be quickly and easily wiped off. The methods of the application of this pyknometer to the purposes for which it has been designed are described in examples. — Chem. News., Jan. 31, 1913, 55-57; from Journ. Amer. Chem. Soc., xxxiv, No. 5.

#### COMMINUATION.

**New Drug Mill.**—*A Practical Form.*—The "Emmerich Machine Works" (Emmerich, a R) have introduced a new drug mill which is recommended as being of eminently practical construction.

The new mill is shown by Fig. 8 and requires little explanation.

FIG. 8.



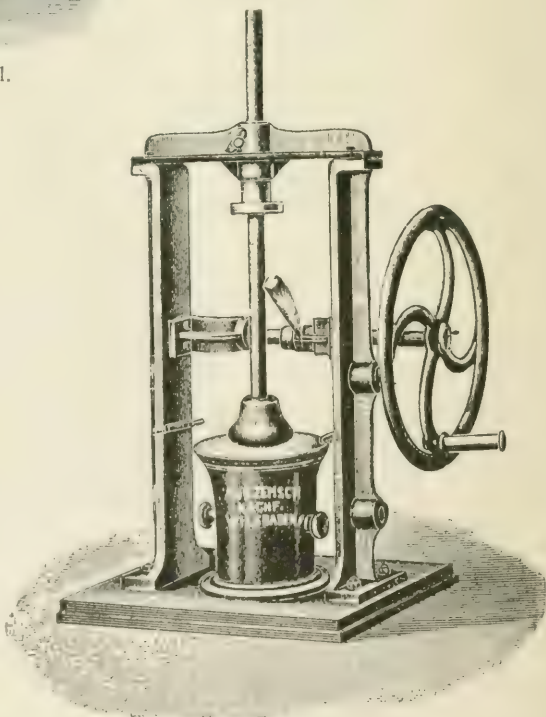
New Drug Mill.

means of its peculiar construction the pestle is raised and dropped, turning completely on its vertical axis during its descent and thus ensures uniform pulverization of all the material in the mortar, and it is claimed that dusty, fine powders are producible by its use with a minimum of manual labor. Obviously the mechanism can also be attached to

The vertical grinding surfaces are of chilled steel, easily removed, cleaned and replaced, and are suitable for coarse as well as for fine powders. The entire apparatus is characterized by solidity and simplicity of construction.—*Pharm. Ztg.*, lviii (1913), No. 43, 427.

**Pulverizing Mortar.**—*Construction with Mechanical Action.*—August Zemsch, Wiesbaden, manufactures the pulverizing mortar with mechanical action shown by Fig. 9, the construction of which requires little description. By

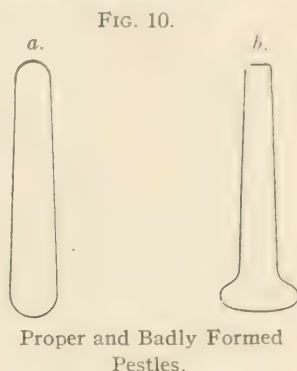
FIG. 9.



Pulverizing Mortar.

motor-power, the mortars being constructed and supplied in various sizes.—Pharm. Ztg., lviii (1913), No. 94, 939.

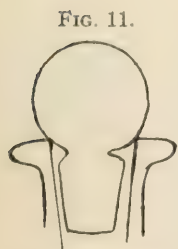
**Mortars and Pestles.**—*Proper Shape.*—Dr. J. Crone calls attention to the inefficient shape of the mortars and pestles in common use. The interior surface of mortars is usually more or less flattened and correspondingly the flat base of the pestle is simply curved upward and frequently inward so as to form a ledge on which some of the material will inevitably accumulate and escape proper admixture or trituration. Whether these utensils are intended for triturations, emulsification or simple admixture of medicaments, the most efficient shape is the semi-globular. The various operations with such properly shaped utensils require less than half the time and are carried out with infinitely more comfort than when utensils with more or less flattened surfaces are used. The author illustrates his subject by the accompanying drawings (Fig. 10, *a* and *b*), showing the correct shape of the pestle by *a* and the incorrect shape by *b*. Pestle *a*, moreover, has the same semi-globular shape at both the nether and upper extremity, the latter being useful for making pill-masses, while the larger, lower extremity is efficiently used for all other operations.—Pharm. Ztg., lviii (1913), No. 79, 791.



#### SOLUTION.

**Loose Stoppering of Alkaline Solutions.**—*A Practical Makeshift.*

—Stoppered bottles containing liquor potassa, liquor bismuthi, Nessler's reagent, Fehling's solution, and many like solutions are very prone to become fixed if care be not taken to wipe the stopper after use. Arthur W. Nunn suggests that this difficulty can be overcome by using loosely fitting globe stoppers (see Fig. 11), which close the orifice just sufficient to keep out air and dust and, he says, preserve one's temper.—Pharm. Journ. & Pharmacist, Dec. 6, 1913, 838.



Loose Stoppers.

**Extraction Apparatus.**—*Compact Form.*—Luise Kalusky has constructed a simple and compact form of extraction apparatus,

which is shown in the accompanying drawing (Fig. 12). The improvement consists of a specially constructed receptacle for the cartridges containing the drug or substance to be extracted, which is inserted into the elongated neck of a flat-bottomed flask and rests upon an accurately fitting perforated support shown in enlarged detail, together with a plunger for packing the cartridges

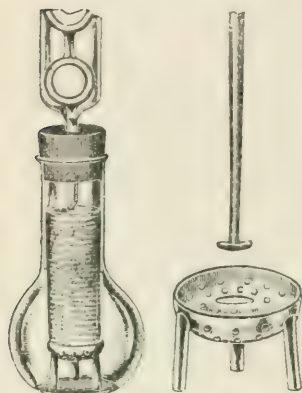
into the casing. These having been inserted, the extracting liquid is carefully poured upon a layer of cotton resting on the enclosed cartridges, until it has percolated through and accumulated to the height of about 1.5 Cm. in the flask. The condenser is then inserted securely into the orifice of the flask, heat is applied, and the extraction carried on as usual—observing, however, that the bottom of cartridge-case does not come in contact with the liquid in the flask by violent ebullition and spurting. The cartridge-case being continuously surrounded by the hot vapor of the boiling liquid, the

substance is completely extracted in less time than is possible in Soxhlets of the conventional form. The apparatus is supplied by the firm Warmbrunn, Quilitz & Co., Berlin.—*Pharm. Ztg.*, lviii (1913), No. 14, 138.

**Continuous Extraction.—Practical Appliance to the Soxhlet Apparatus.**

—The Berlin firm of Warmbrunn, Quilitz & Co. have introduced a practical appliance to the Soxhlet extractor which is illustrated by the accompanying cuts (Figs. 13, 14, 15). It consists of a thick-walled glass tube (Fig. 13) perforated with numerous holes, expanded funnel-shaped on top and drawn to a point beneath, which is closed by fusion in the flame. This is covered with a closely fitting slip of straining cloth so that the holes may not become clogged when intro-

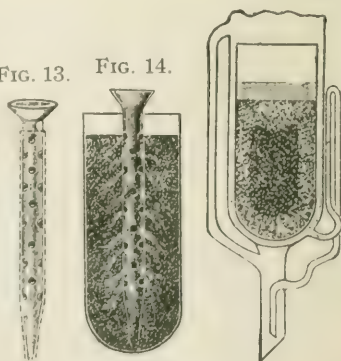
FIG. 12.



Extraction Apparatus.

FIG. 15.

FIG. 13. FIG. 14.



Continuous Extraction Apparatus.



duced into the powder contained in the cartridge, as shown by Fig. 14. In action, the condensed solvent drops into the funnel-shaped opening of the tube and is equally distributed throughout the powder, which is then rapidly and completely extracted, the loaded solvent being carried into the distilling flask, as shown by Fig. 15, instead of permitting it to accumulate on the surface of the powder. Pharm. Ztg., lviii (1913), No. 65, 645; from Chem. Ztg., 1913, No. 91.

#### FILTRATION AND PRECIPITATION.

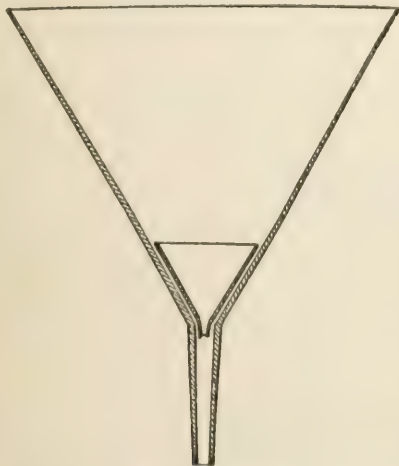
**Truncated Fluted Filters.**—*A Practical Novelty.*—The beaker-shaped (truncated), folded filter shown by Fig. 16, made from resistant filter paper that will not tear easily even when the larger sizes are used, is manufactured and marketed by the firm of Macherey, Nagel & Co., of Dürren (Rhld.). The new fluted filter has the advantage over the ordinary form that, the folds ending on a flat surface, the paper is not weakened by the numerous creases necessary; and, furthermore, that the flat extremity of the filter has the additional support of perforated glass cones, provided for insertion

FIG. 16.



Fluted Filter.

FIG. 17.



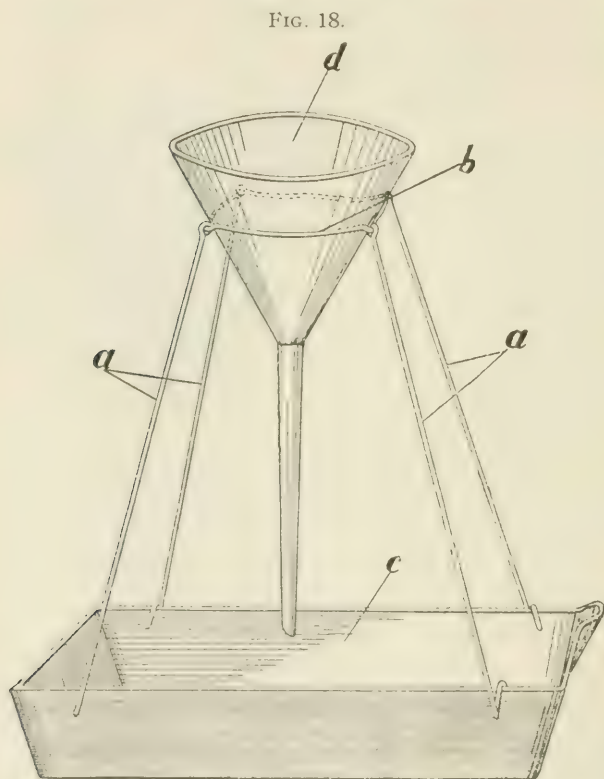
Rapid Filtration.

into the funnel cone and adapted to the size of the filter.—Pharm. Ztg., lviii (1913), No. 58, 572.

**Rapid Filtration.**—*A Convenient Expedient.*—F. W. Nitardy calls attention to a method of rapid filtration which has been in use in his laboratory with satisfaction in the case of all liquids that do not clog the filter paper. He says that any liquid that will pass through paper rapidly will frequently filter quite slow because the paper lays close even to a ribbed funnel, not permitting

the liquid to pass very rapidly. This was overcome by a simple expedient, originated by his assistant, Mr. Towers, which consisted in placing a small ribbed funnel into a large one, as shown in the accompanying drawing (Fig. 17), thereby producing a space between the two funnels for the liquid to pass. Filtrations can thus be accomplished in about one-fifth the usual time.—*Journ. A. Ph. A.*, March, 1913, 320.

**Wire Funnel Support.**—*A New Device for Filtering Operations.*—Heinr. Gohl, of Suhr, Canton Aarau, has devised and supplies



Wire Funnel Support.

the funnel support shown by Fig. 18, which is constructed of steel wire and very efficiently replaces the more massive supports ordinarily in use, being adjustable to evaporating vessels, *c*, which may be either square, oval or circular, in the manner depicted, the number of uprights, *a*, being increased in the case of oval and circular vessels as may be needed.

The ring *b*, being hinged, the support may be folded so as to occupy little space in transportation. —*Pharm. Ztg.*, lviii (1913), No. 14, 138.

**Automatic Filtration.**—*A Convenient Apparatus.*—B. Bergdahl has devised a convenient apparatus for automatic filtrations in the analytical laboratory, the details of which are illustrated by

Figs. 19, 20 and 21. It consists of a flask similar in shape to the Erlenmeyer, but without lips (Fig. 20), which is fitted with a valve attachment (Fig. 21) held in place by a rubber band, as shown by Fig. 19, *a* and *b*. The liquid requiring filtration being poured

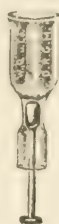
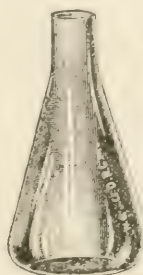
FIG. 19.



FIG. 20.



FIG. 21.



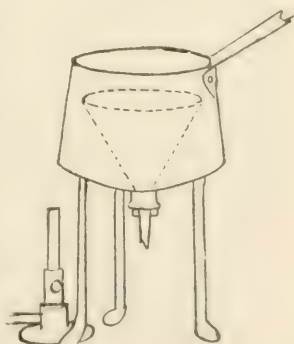
Automatic Filtering Apparatus.

into the flask and the valve piece attached, the flask is inverted and suspended above the filter as shown at *a* (Fig. 19). On lowering the flask into the funnel until the valve rod touches the apex of the filter cone, the valve is opened

and the liquid flows into the filter until the wide mouth of the valve attachment is covered. Filtration then proceeds automatically as fast as the liquid passes through the filter. The apparatus is supplied by Warmbrunn, Quilitz & Co., Berlin.—Pharm. Ztg., lviii (1913), No. 34, 338.

**Hot Filtration.**—A *Makeshift Jacketed Funnel*.—Having occasion to filter a culture medium of a gelatinous nature, Arthur W. Nunn constructed the makeshift hot water funnel shown in the accompanying drawing (Fig. 22). A round hole was cut into the bottom of a porridge sauce pan, the neck of a pint "Jeyes' Fluid" tin was soldered around this hole on the outside, and a perforated cork, comfortably fitting the stem of a glass funnel, was inserted from below, the whole being mounted on a tripod. Warm water was then run into the sauce pan nearly to the top of the funnel, the heat being maintained by a Bunsen burner placed at the edge of the pan—this simple ap-

FIG. 22.



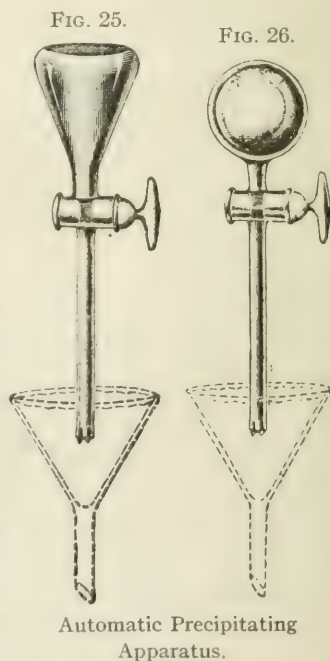
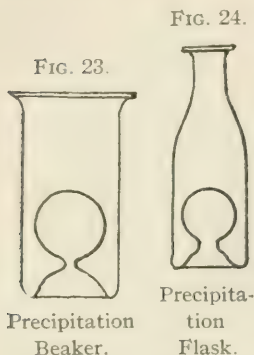
Hot Filter.

paratus answering its purpose admirably.—Pharm. Journ. & Pharmacist, December 6, 1913, 838.

**Precipitating Beaker and Flask.**—*New Form for Volumetric Analyses.*—W. N. Iwanow recommends the precipitating beaker and flask shown by Figs. 23 and 24 for volumetric analytical operations, particularly for determinations of silver and of chlorine. The bulbous expansion on the bottom of the interior has for its purpose the separation of the precipitated  $\text{AgCl}$  as fast as formed, this settling between the walls of the beaker or flask and the bulb, leaving the supernatant liquid free from precipitate until the titration is completed. These beakers and flasks are supplied by the firm C. Gehhardt in Bonn a/Rh.—Pharm. Ztg., lviii (1913), No. 34, 338; from

Chem. Ztg., 1913, No. 42.

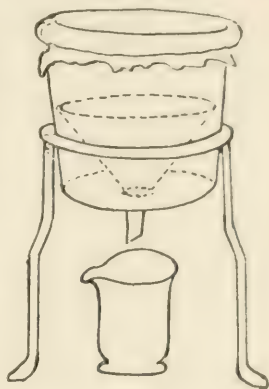
**Precipitates.**—*Device for Automatic Washing.*—B. Bergdahl recommends a convenient device for washing precipitates in laboratory operations, which is shown in two forms by Figs. 25 and 26, and requires little explanation. It consists of a flask or other similar vessel having a long neck of sufficient diameter to permit the air to pass into the flask when in operation. The extremity of this neck or tube is notched and the inflow is regulated by means of a glass cock, immediately beneath the reservoir as shown in the cuts. Suspended over and into the filter containing the precipitate to be washed, the washing liquid flows from the reservoir until its level covers the notched extremity of the outflow tube, then continuing automatically as fast as the liquid passes through the filter. The apparatus is supplied by Warmbrunn, Quilitz & Co., Berlin.—Pharm. Ztg., lviii (1913), No. 34, 338.





**Washing Bulky Precipitates.**—*A Makeshift Contrivance.*—The washing of a bulky precipitate is tedious and sometimes difficult, but Arthur W. Nunn describes a makeshift apparatus (shown by Fig. 27), which provides a clean and effective means. An ordinary flower pot, 7 in. high and 8 in. across the top, after scrubbing it well and drying, is mounted on a substantial tripod, and a pint glass funnel is dropped into the hole in the bottom of the pot so that the neck protrudes. A piece of washed linen is then tied over the mouth of the pot in such a way that there shall be a slightly concave surface to take the precipitate. The subsequent washing and draining is by this contrivance much facilitated, as well as the testing of the washings for completion.—*Pharm. Journ. & Pharmacist*, December 6, 1913, 838.

FIG. 27.

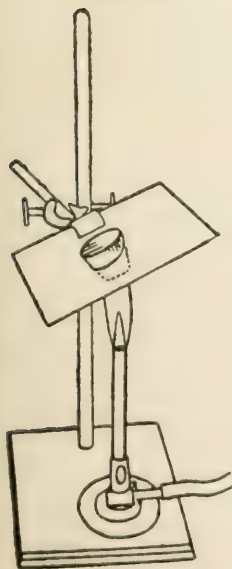


Precipitate Washer.

## APPLICATION OF HEAT.

**Crucible Operations.**—*Protecting Device against Flame Gases during Ignition.*—Alexander Charles Cumming describes the device shown by Fig. 28, which has been used in the Chemistry Department of the University of Edinburgh for some time for the protection of the crucible contents during ignition. It consists of a silica plate, 5 inches square, with a hole bored in it of such size as to admit a crucible to one-half its depth, the silica plate being held in an inclined position by a clamp, as shown. By this means the flame gases are excluded from the interior of the crucible during the ignition. With this device calcium carbonate in a platinum crucible is quickly reduced to oxide with a good Bunsen burner, while with a Meker burner the reduction is complete in a few minutes, even when a porcelain crucible is used.—*Chem. News*, April 11, 1913, 169; from *Proc. Royal Soc. Edinburgh*, xxii, Part I (No. 4).

FIG. 28.



Crucible Protector.

**Device for Handling Hot Evaporating Dishes.**—Charles H. LaWall, Ph.M., suggests the following device: Take a No. 10 or No. 12 cork and, beginning at the small end, cut as lit in it slightly wider than the thickness of the dish and running back about three-fourths the length of the cork. When completed, this makes a springy handle which can be slipped over the side of the dish and firmly grasped with the fingers without danger either of burning them or contaminating the contents of the dish. For large or heavy dishes two of the improvised handles may be used, one being slipped over each side of the dish when it is to be moved.—Proc. Penn. Phar. Assn., 1913, 269. (E. C. M.)

**Magnesia Utensils.**—*Adaptability to High Temperature Operations.*—Since recommending magnesia rods as an efficient substitute for platinum wire in chemical operations requiring high heat (see Year Book, 1912, 24), E. Wedekind has found that the same magnesia material may be used with advantage for making other utensils to replace platinum, such as spoons, boats, crucibles, test tubes, etc., and he predicts that ere long magnesia utensils will be part of the outfit of all well-appointed chemical laboratories. Regarding the "*Magnesia-Mass*" for the construction of these utensils, the author observes that this at first was mainly composed of pure magnesia. In practice, however, it proved too brittle for certain operations and the proportion of magnesia was, therefore, gradually reduced, so that at present the mass consists mainly of kaolin, although the original designation "magnesia rods" is retained for the product.—Pharm. Ztg., lviii (1913), No. 58, 573; from *Ztschr. f. angew. Chem.*, 1913, No. 41.

**Microsublimation under Reduced Pressure.**—R. Eder outlines his researches in this direction, showing that previous efforts on microsublimation under normal atmospheric pressure frequently destroyed the volatile substance or prevented its condensation in pure crystalline form.

He describes two forms of apparatus: (a) A simple Jena glass beaker with the center of the bottom drawn into a small nipple-shaped depression and with the top fitted with a rubber cork and glass tube leading to suction pump and manometer. (b) With lower portion like the beaker in (a), but fitted by a ground glass joint with an upper cylinder in which a thermometer can be inserted. In using either type, the substance to be sublimed is placed in the depression, a microscope cover glass fitted over the depression, the apparatus made air-tight, fitted to the suction, the air exhausted

to 10 Mm. pressure and then so adjusted that the lower half of the depression is immersed in a sulphuric acid bath. This bath is then heated, with temperature rise carefully noted until sublimation proceeds. The rest of the article gives detailed results of such sublimation, showing speed of satisfactory sublimation (8 minutes for a sublimation at  $100^{\circ}$  to 20 minutes for  $200^{\circ}$ ); temperature of sublimation at 10 Mm. pressure (e. g., cocaine  $75^{\circ}$ – $90^{\circ}$ , solanine  $168^{\circ}$ – $184^{\circ}$ ); identification of the sublimate by shape of crystals and by microchemical reagents. He groups the alkaloids according to behavior while subliming as follows. A. Those subliming without fusion subdivided into three classes according as to whether (1) the sublimate is directly crystalline; (2) is first in amorphous drops, then crystalline; (3) is in amorphous drops rather than crystals. B. Those subliming after fusion. C. Those decomposing without sublimation. Most alkaloids studied belonged to the first class.

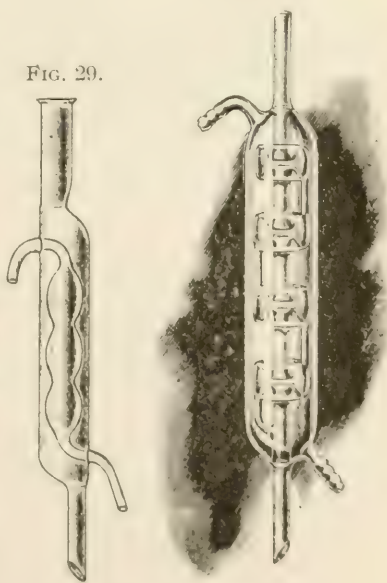
He then discusses the formation of crystals by sublimation showing that the farther below the melting point the subliming point is, the better the crystallization. The article closes with personal experiences in detecting minute amounts of alkaloids by use of the process.—Schweiz. Wschr. f. Chem. u. Pharm., 51 (1913), Nos. 16, 17, 18, 228, 241 and 253. (H. V. A.)

**New Ball-Condenser.**—*Efficient Form, Suitable for Ordinary and Reflux Condensation.*—Dr. K. Lüdecke has devised the ball-condenser, shown by the accompanying cut (Fig. 29), which is so constructed that when properly adjusted none of the distillate is retained in the condenser during ordinary distillations, even when it is only moderately inclined from the horizontal. The condenser, which is 40 Cm. long, may also be used as a reflux condenser. It is supplied by the firm of Muencke Bros., Berlin N. W. 6.—Pharm. Ztg., lviii (1913), No. 65, 644; from Chem. Ztg., 1913, No. 83.

**Ball-Reflux Condenser.**—*New Modification of the Liebig Form.*—

FIG. 30.

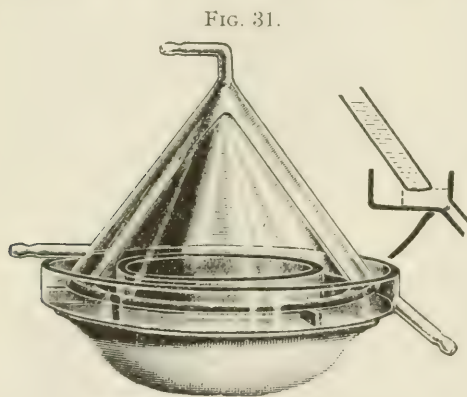
FIG. 29.



New Reflux Condenser.

In order to increase the efficiency of the ball form of reflux condenser, Dr. Walther Friese has modified the ordinary Liebig ball condenser as shown in the accompanying sketch (Fig. 30). The arrangement and action of this modification requires little explanation. The cooling balls are depressed towards the central sections of the condensing tube and the openings of these sections are correspondingly elevated and depressed, thereby largely increasing the condensing surface of the interior. The condensed solvent flows downward through small tubes which unite the balls alternately on opposite sides and thus returns to the extraction flask as the vaporized solvent is again condensed during its upward passage through the central tube. The modified condenser is supplied by the firm of Franz Hegersdorff & Co., Leipzig.—*Pharm. Ztg.*, lviii (1913), No. 65, 644; *Pharm. Zentralh.*, liv (1913), No. 27.

**Recovery of Organic Solvents.**—*Convenient and Efficient Construction.*—Dr. W. Friese describes a convenient and efficient ap-



Vaporizer for Organic Solvents.

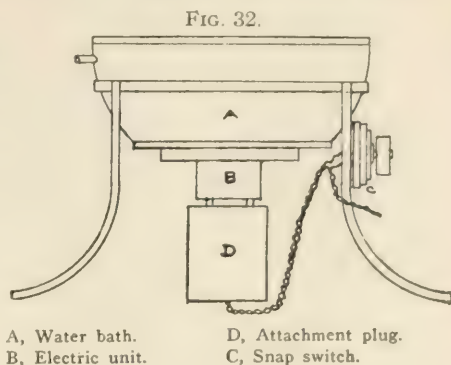
paratus for the recovery of volatile organic solvents which is shown by Fig. 31. It consists in essentials of two parts: (1) a double-walled, funnel-shaped bell, with an inflow tube below and an exit tube on the top of the cone for the circulation of cooling water; and (2) of a circular gutter or conduit for carrying off the condensed fluid as it trickles from the inner

surface of the funnel bell, the latter resting upon three glass feet or, if metal is used for the construction, of stout tin plate (as shown in the supplementary diagram) so as to elevate it above the flat bottom of the shallow conduit, which is placed directly over the edge of the evaporating or crystallizing vessel. The vaporized solvent rising into the interior of the funnel bell condenser, collects in the conduit and is thence directly carried into the receiving vessel through the outflow tube shown in the drawing.—*Pharm. Ztg.*, lviii (1913), No. 43, 427.

**Electrical Water Bath.**—*Simple Construction and Convenience.*—John W. Forbing describes the electrical steam bath shown by the



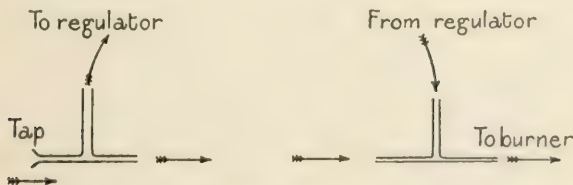
accompanying drawing (Fig. 32) which fills the demand for convenience and safety, in laboratories lacking live steam and employing inflammable liquids, and is easily constructed as follows: A 500 ampere General Electric heating unit, round and flat, is soldered into the bottom of an ordinary copper constant level water bath. The unit is connected with an attachment plugscrewed into one of the legs of a tripod which may be used to construct the bath. Cord and bubble attachment plug enables the user to move the bath to suit convenience. The several parts are clearly shown in the drawing. As used by the author on a 110-volt, 60-cycle alternating current, 475 watts are consumed. Only 3 minutes are required to bring the contents of the bath to ebullition.—Journ. A. Ph. A., December, 1913, 1561.



Electric Water Bath.

**A Simple Thermo-Regulator.**—*Construction.*—J. G. Boyd and H. M. Atkinson have devised and describe a simple and economical thermo-regulator, the details of which are shown by Figs. 33 and 34. A stout test tube (about  $6 \times \frac{3}{4}$  in.) is closed with a good cork (rubber being attacked by toluene), through which a capillary

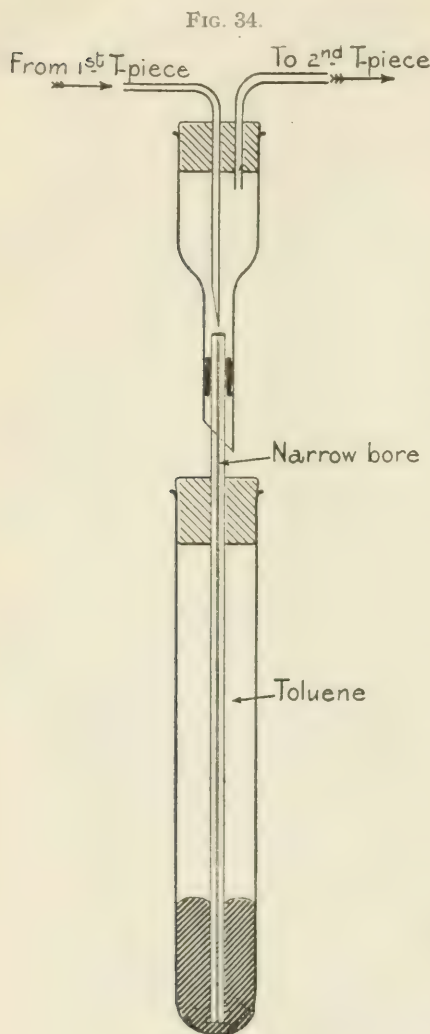
FIG. 33.



Thermo-Regulator.

tube passes and is fitted by a rubber band into the narrow part of an ordinary filtering tube. This has a double-bored stopper with two right-angled glass tubes, one reaching down inside to near the top of the capillary tube, and ground off like the stem of a funnel, but more acutely, with a piece of carborundum. The

other right-angled tube extends to a little below the stopper. Mercury is poured into the stout test tube to the height indicated in Fig. 34, the narrow bore capillary tube dipping to the bottom of



Thermo-Regulator.

this, then toluene or other liquid (water serves for approximations) to fill the test tube, and tightly corked. To ensure that mercury fills the capillary tube this may be gently rotated a little way up before corking, and when corked pushed down again. A few drops of mercury are introduced into the filter tube to cover the top of the capillary, and the apparatus is ready to immerse in the thermostat. By raising or lowering the gas entry tube any desired volume of gas can pass through and hence the desired temperature. To prevent the flame of the Bunsen burner when very low from striking back, two glass T-pieces, as shown by Fig. 33, are inserted between the inflow and outflow of gas, to provide an independent supply to the burner controlled by a screw clip.—Chem. News, November 21, 1913, 248.

**Apparatus for Freezing-Point Determinations.**—E. H. Bartley describes a new form of apparatus for freezing-point determinations in which he secures low temperatures by

means of ether and carbon disulphide.—J. Am. M. Assoc., 1913, v. 61, 991. (M. I. W.)

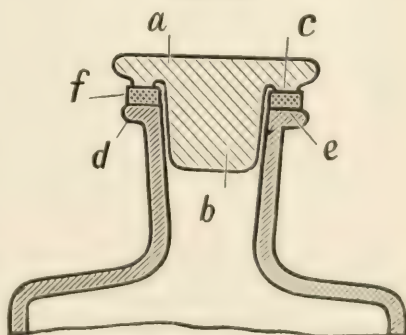
**Desiccation of Organic Products in the Cold.**—*Complete and Quick Method.*—A. Sumière and J. Chevrotier communicate the

results obtained by experiments on the absorption of water from fresh tissues, serums or extracts, by anhydrous salts. On mixing a definite weight of sodium phosphate ( $\text{Na}_2\text{HPO}_4$ ), with the same weight of any organic liquid which is to be dried, a perfectly dry powder is obtained, by reason of the water of the organic liquid having been absorbed to produce the dry, hydrated sodium phosphate. The anhydrous salt being able to absorb more than one and a half times its weight of water to form the crystallized phosphate, by mixing equal parts of the anhydrous salt and the organic liquid, part of the dehydrating body is not used, and consequently there is complete desiccation of the mixture. According to the liquids to be dried and the uses to which they are to be put, various anhydrous salts may be employed, and 100 Gm. each of the following absorb quantities of water, as follows: Sodium phosphate, 152 Gm.; sodium sulphate, 127; magnesium sulphate, 105; borax, 90; fused sodium acetate, 67; copper sulphate, 56; quicklime, 32; sodium thiosulphate, 19. By this means desiccation may be effected without having recourse to heat or the vacuum. On mixing the anhydrous salt and the organic liquid, heat is developed, but this can be avoided by previously cooling the substances, or by mixing small portions at a time in a cooled mortar.—Pharm. Journ. and Pharmacist, Feb. 1, 1913, 135; from L'Union Pharm., January, 1913, 5.

#### STERILIZATION.

**Sterilizing Flask.**—*Improved Method of Stoppering.*—Wolters recommends a new method of stoppering sterilizing flasks which is illustrated by the accompanying cut (Fig. 35). An ordinary glass stopper, *a*, elongated so as to enter well into the neck of the flask, as shown at *b*, rests with its accurately ground edges, *c*, on the surface of the elastic ring *f*; this, in turn, rests on the ground surface of the neck of the flask *e*, the lips of which are extended, as shown at *d*, so that the several parts may be held securely during sterilization by means of clamps or springs. These being removed after sterilization, the flask will remain securely

FIG. 35.



Sterilizing Flask.

closed and its contents remain free from germs so long as the atmospheric pressure prevails, *i. e.*, until the flask is opened for the removal of its contents. Sterilizing flasks provided with the modified form of stoppering are marketed by Paulus and Thewalt, of Höhr.—*Pharm. Ztg.*, lviii (1913), No. 43, 426.

**Sterilization.**—*Modern Steam Sterilization.*—Max Rubner discusses the development of steam disinfection during recent years. The chemical and physical action of steam and some discussion of steam-formaldehyde disinfection.—*J. Am. M. Assoc.*, v. 60, 1344–1348. (M. I. W.)

**Sterilization in Pharmacy.**—A. Parker Hitchens, M.D., describes the problems of sterilization and clearly defines the terms sterilization, disinfection, disinfectant, germicide and antiseptic. He gives the varying methods of sterilization and their effects and values, with complete tests for sterility. He concludes by saying, "It is evident that if remedies for subcutaneous administration are to be dispensed only after passing through the rigorous tests mentioned above, they can be prepared only by persons who have had training in bacteriological technique. A realization of this fact is leading the Colleges of Pharmacy to give their students advanced training in special bacteriological technique. To be useful such courses should be thorough. It is apparent that here a little knowledge might be a dangerous thing indeed. Certain criticisms of the tests suggested for the preparation of remedies for parenteral administration will undoubtedly be made. Some persons will say, many others will think, that we have been getting along all these years with much simpler methods, why not continue? Because the simpler methods are the cause of serious and even fatal infections. We learn of some of them; there are probably ten times as many that we never hear about. The demand for sterile solutions for hypodermic and intravenous injection is destined to increase, these solutions must be sterile and their sterility must, before use, be demonstrated by adequate tests."—*Proc. Penn. Phar. Assn.*, 1913, 225–232. (E. C. M.)

**Sterilization.**—*A New Method for Nebulizable Liquids.*—Dr. F. Hering describes a new method of sterilizing fluids that cannot be heated up to 100° without decomposition, which consists in nebulizing them into a sterile compartment heated permanently to a temperature of 75°. The nebulized liquid, milk for example, is exposed in this only for a moment to the heat, during which it reaches a temperature of about 50°–60°, but this suffices to de-



stroy any vegetative forms of bacteria present in the milk (or other fluid) being immediately collected in a chilled and sterile receptacle and sealed in the usual manner. The method is successfully employed in the Leipzig progressive dairy industry, is very economical, and is capable of turning out 1000 liters of germ-free milk per day. Obviously it is applicable to all fluids that are convertible into nebulous vapor by means of a nebulizer.—Pharm. Ztg., lviii (1913), No. 32, 317.

**Sterilization.**—*Decomposition of Alkaloidal Solutions.*—Dr. Gustave Mossler, in a paper before the convention of German Naturalists in Vienna, treats this complicated subject in an admirable manner. Solutions of the following alkaloids can be sterilized, even at a temperature of  $100^{\circ}\text{C}$ : Morphine hydrochloride, Codeine hydrochloride, Dionin, Quinine bihydrochloride, Cotarnine hydrochloride, Tropa-cocaine, Beta-eucaine and Novocaine. Solutions of Pilocarpine can be sterilized at  $100^{\circ}\text{C}$ . The following begin to be decomposed at a temperature of  $100^{\circ}\text{C}$ .: Cocaine hydrochloride, Heroine hydrochloride, Stovaine hydrochloride and Atropine sulphate. The following solutions can *not* be sterilized by heat: Morphine acetate, Apomorphine hydrochloride, Alypin, and Physostigmine salicylate. In total, 17 alkaloids have been reported upon.—Ph. Zhalle., 1913, No. 44. (O. R.)

**Sterilization.**—*Indicator.*—Chevallier describes a new method of sterilization in which an indicator is used which consists of acetanilide containing 1% of eosine. At ordinary temperature this mixture is slightly pink, but when the melting point of acetanilide ( $114^{\circ}\text{C}$ .) is reached, then it assumes a bright red color, which is permanent. By the use of this indicator, contained in an extra ampul, it can be readily seen if the ampuls have been subjected to a sterilizing temperature of  $114^{\circ}\text{C}$ .—Bull. gen. de Therap., 1913. (O. R.)

#### CONTAINERS.

**Improper Containers.**—*A Fruitful Cause of Deterioration.*—At the Denver meeting of the Association, B. L. Murray read a timely paper on some of the causes of the deterioration of drugs, which will be consulted with advantage. Many of the articles sold by the pharmacist are handled in containers not well suited to the proper keeping of the goods. The remedy is the selection of a suitable container, and to insist that the dealer will supply them in such. In short, (a) goods deteriorate for lack of proper containers; (b) proper containers for all articles are procurable; (c)

to get them with certainty it is at present necessary to ask for them, at times with emphasis.—*Journ. A. Ph. A.*, April, 1913, 446-449.

**Ampuls.**—*A New Filling Apparatus.*—Dr. W. Boltze has constructed and describes a new apparatus for filling ampuls which has marked advantages over the usual form employed for this purpose.

FIG. 36.



Prescription  
Ampul  
Filler.

It is shown in the accompanying cut (Fig. 36) in which the individual parts are joined, the latter being shown in enlarged detail by Figs. 37, 38, 39 and 40. The principal part (Fig. 37) is the flask used as receptacle for the liquid to be filled. The hollow stopper 1 is provided with a small hole which when in proper position is coincident with a similar hole in the neck, the latter leading into a thimble extension for the reception of sterile cotton through which the air is admitted into the interior of the flask. Similarly the tube 2 is provided with a thimble end, 3, for the reception of sterile cotton through which air is admitted into the apparatus when in use, this tube also preventing the outflow of liquid if by oversight the cock 4 has not been closed, and also serving the purpose of making connection at 3 with the suction pump if such be necessary. The mouth piece 6, to which tube 2 is attached, is somewhat expanded and is provided with two hooks which serve to make the connection of the outflow tube 5 with the burettes (Fig. 39 or 40), these being held in place by metal springs or by gum bands as shown in Fig. 36. They differ from the ordinary forms in being graduated into 1.1, 2.1, 3.1, 4.1, 5.1, or 10.1 Cc., depending on the desired quantity of medicament to be introduced into the ampul. To facilitate the reading, there are no intermediary graduations, each fraction being indicated as a whole by the engraved ring which completely encircles the stem of the burette. The additional 0.1 Cc. is made to compensate for the liquid adhering to the walls of the ampul, so that the full

dose of the medicament may be delivered from it. As shown by Fig. 40 these burettes are also supplied enclosed in a mantle for the reception of refrigerating or heating fluids. The appendage Fig. 38 is employed, with or without glass cock, when the ampuls are to be filled without measurement, the delivery needle being attached by means of gum tubing, as shown in Fig. 36, when the attachment is made direct to the burettes. The needles

should be of pure nickel or of platinum-iridium. When made of steel they are attacked even by faintly acid solutions and quickly rust. The outflow from the needle is best regulated by means of a small glass ball inserted into the rubber connecting tube.

The advantages claimed by the author are that the individual parts of which the apparatus is composed secure solidity, simplicity, and convenience in cleaning and sterilizing the apparatus; permit celerity in filling the medicament into ampuls, facilitate the readings, and provide

FIG. 37.

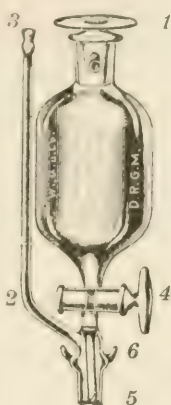


FIG. 39.

FIG. 40.

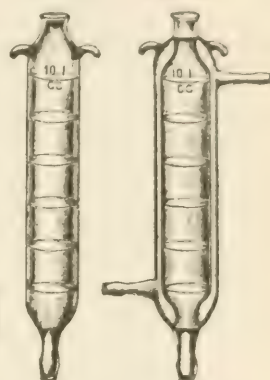


FIG. 38.



Improved Prescription Ampul Filler.

FIG. 41.



New Ampul Filler.

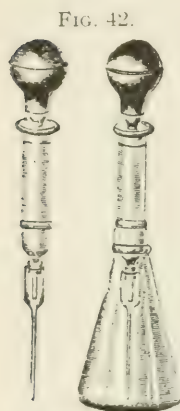
the possibility of filtering the air admitted, of filtering the solution by interposing a funnel (shown in the original but not here reproduced), of cooling or heating the liquid during the filling, of operating under diminished or increased pressure, and, in short, operating throughout under practically sterile conditions.—*Pharm. Ztg.*, lviii (1913), No. 20, 197-198.

**Ampuls.**—*New Filling Apparatus.*—Hoger has constructed the new rinsing and filling apparatus, shown by Fig. 41, which is supplied by the firm Franz Huger-shoff, Leipzig. The apparatus consists in essentials of the funnel *A* containing a glass tray, *F*, which is enclosed hermetically by the globular bell glass *B*. The ampuls are placed into the tray, with their



opening downward, a sufficient quantity of water acidulated with hydrochloric acid is introduced through the bulb funnel *C*, and, the connections being securely made, the apparatus is alternately evacuated and filled with air, whereby the cleansing and rinsing of the ampuls is effected. The acidulated water is then replaced by pure distilled water, repeating this process with several fresh portions, and finally the water is replaced by the solution to be enclosed in the ampuls, which are thus automatically filled, and on removal may be sealed in the usual way and sterilized.—*Pharm. Ztg.*, lviii (1913), No. 14, 138.

**Prescription Ampul Filler.**—*A New and Practical Device.*—Wachsmann has devised the new ampul filler shown by Fig. 42, which is intended for convenience at the prescription counter. It consists of a pipette of special form fitted with a hollow ground glass stopper surmounted by a rubber ball, the outlet of the pipette being so constructed that 20 drops delivered from it measure exactly 1 Cc. To this outlet the filling needle, of glass or metal, is fastened externally with rubber, while the conical vessel in which the filler rests is intended for the reception of any drops of liquid from the filler when the operation is interrupted or ceases altogether. The apparatus is filled with the liquid to be transferred into ampuls by removing the hollow ball stopper and pouring it direct into the pipette. Suction, or contact with rubber is thus completely avoided while the operation is very much simplified. The new apparatus, which may be conveniently sterilized, is marketed by the firm of J. H. Büchler, Breslau.—*Pharm. Ztg.*, lviii (1913), No. 58, 572.

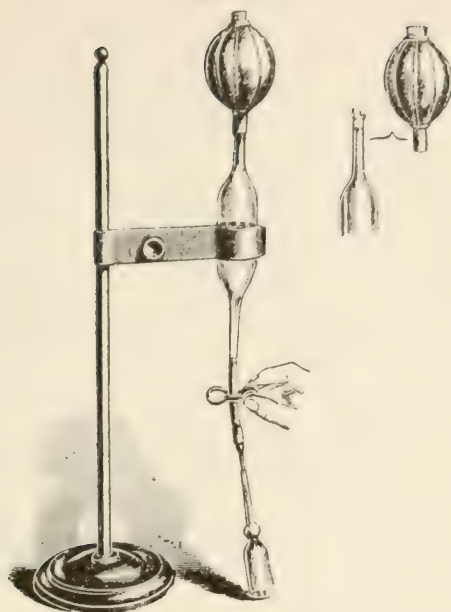


Ampul Filler.

**Ampul Filler.**—*Economic and Efficient Construction.*—Stich directs attention to the efficiency of one of the older forms of ampul fillers, which is illustrated by the accompanying cut (Fig. 43). It consists of an elongated bulb with attenuated necks, below and above, which is held in position in a clamp attached to an ordinary stand. A stout rubber tube with a glass needle and bearing a clip, is slipped over the lower orifice, while the upper orifice is closed with a tuft of cotton after the bulb has been filled with the sterilized solution by suction with the water pump, whereupon the clip is closed. Aqueous solutions will flow out rapidly on opening the clip, but denser fluids may require the application of pressure,



FIG. 43.

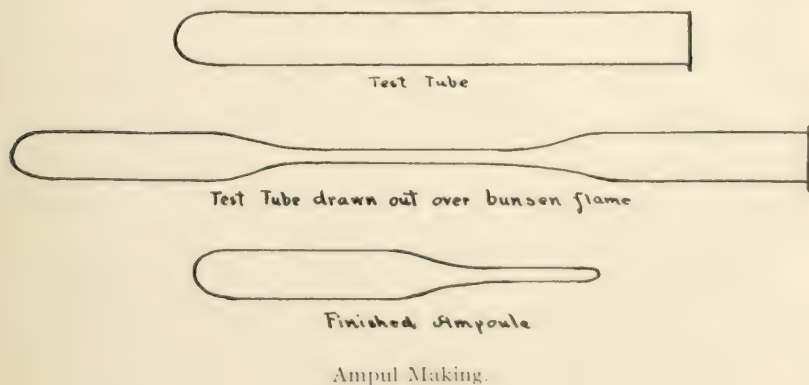


Old Style Ampul Filler.

which is supplied by the rubber pressure bulb shown in the details of the drawing. The glass portions of the apparatus are sterilized dry, the rubber tube in a test tube or glass cylinder filled with water. —Pharm. Ztg., lviii (1913), No. 23, 229.

**Ampuls.**—“*Home-Made*” Construction from Test Tubes.—F. W. Nitardy directs attention to a convenient emergency method of

FIG. 44.



making ampuls, for which ordinary test tubes are quite suitable. The operation consists in selecting a clean test tube of suitable size and drawing it out in a Bunsen flame as shown in the accompanying drawing (Fig. 44). After filling, the ampul is sealed and sterilized—the whole operation being quickly done and inexpensive.—*Journ. A. Ph. A.*, March, 1913, 320.

**Ampuls.**—*Apparatus for Cutting Necks of Uniform Lengths.*—Ampuls as supplied for filling necessarily vary in size of body as well as length of neck. The neck being sealed it must be cut off,

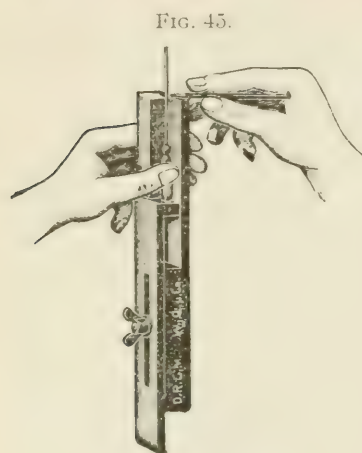


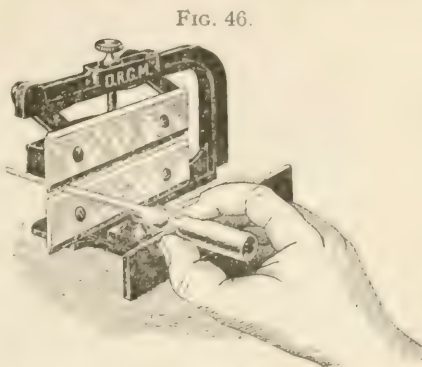
FIG. 45.  
Ampul Cutting.

an operation which is both troublesome and time-consuming, in order to secure cuts of equal length and without fractured surfaces of the cut. To facilitate this operation it has been customary to provide a wooden block, excavated on one of its surfaces so as to accommodate the ampul, which is then scratched with a file, knife or diamond at a point indicated by a mark. But this apparatus accommodates only ampuls of the same size, and required expert manipulation to prevent the fracture of the neck. Dr. W. Boltze has now constructed a simple apparatus which accommodates ampuls

of any desirable size. As shown by Fig. 45 it consists of two blocks, one concave, the other fitted into the cavity and held in position by means of a set-screw running in a slot, so that according to the size of the ampul it may be raised or lowered at will. The cut is made with a diamond as shown in the drawing, at the protruding point of the stem—the ampul being firmly held in place by the thumb of the left hand. From eight to ten thousand ampuls can be conveniently cut by the aid of this simple apparatus in a single day.—*Pharm. Ztg.*, lviii (1913), No. 20, 198.

**Ampul Cutter.**—*Improved Construction.*—The ampul-cutting apparatus introduced in 1912 under the name of "Rapidax" for conveniently cutting the stems of ampuls—here shown in its original form by Fig. 46—has now been improved by substituting for the steel knife blades two silicium prisms. These do away with the repeated sharpening of the steel knife blades, which soon become

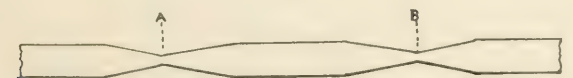
dull in use, and although by the use of the prisms only one ampul can be scratched at a time, this can be accomplished in the fraction of a second with absolute safety. The improved apparatus is applicable with equal efficiency to the scratching of glass tubes of any kind, with the advantage that no splinters are formed on breaking off the scratched end, while the length of the ampul necks are uniformly the same, this length being regulated by drawing out or pushing in the sliding rest held in place by a set-screw.—The apparatus is supplied by Erich Koellner, of Jena.—Pharm. Ztg., lviii (1913), No. 23, 228.



Ampul Cutter.

**Ampuls.**—*Making, Filling and Sterilization in a Retail Store.*—In commenting on ampuls Ernest R. Jones, Ph.C., says they may be quite readily made from soft glass tubing. The tubing should be free from bubbles and of uniform bore. It must be tested for alkalinity by thoroughly rinsing in distilled water and adding phenolphthalein. If alkaline, boil with dilute hydrochloric acid, rinse and boil in distilled water again. After drying, draw out into pointed tubes, as in Fig. 47. The tubes are then cut at A

FIG. 47.



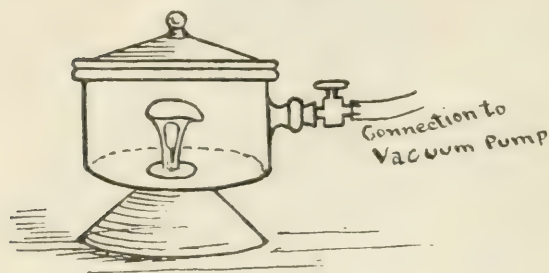
This etching shows the tubing drawn out at A and B preparatory to making the ampoules.

Ampul Making.

and B, one end sealed and the other left open for filling. While still empty, they may be sterilized in a 5 per cent. solution of phenol, rinsed in sterile water and dried. The solutions for filling ampuls should be carefully filtered to free them from dust and other particles. While ampuls may be filled from a burette having a long capillary point, the process is tedious and the writer prefers a vacuum process. A suitable vacuum apparatus may be arranged according to Fig. 48. A desiccator is connected by a rubber tube with a vacuum pump fastened on the laboratory water

faucet. In a small graduate is placed the solution allowing an additional one-eighth for loss, as the physician cannot completely empty the ampul. Into the graduate also is placed the ampul,

FIG. 48.



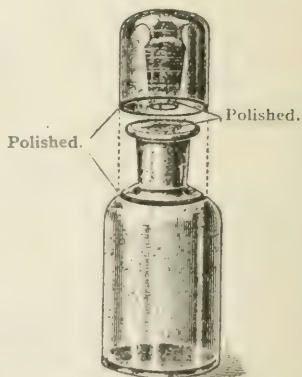
Ampul Filler.

open end down and the graduate then set in the desiccator. The air is now pumped from the desiccator and from the ampul. When the air ceases to bubble from the ampul through the liquid, the vacuum is released and the

returning pressure forces the solution into the ampul. The liquid in the neck of the ampul would interfere with its being sealed, hence the ampul is reversed in the graduate, that is, the open end up, and now a vacuum is formed again, which draws the solution from the neck and it is caught in the graduate. Now the end may be sealed in a Bunsen flame. The writer further gives methods for the sterilization of the filled ampuls, recommending the use of live steam, as hot water seems to break more of the ampuls.—*Bull. Pharm.*, January, 1913, 27-28. (C. M. S.)

**Reagent Bottles.**—*Improved Form.*—Reuter has devised a modification of the capped form of reagent bottles, which securely protects the lips, neck and shoulder of the bottle from dust and thus accidental contamination of its contents by the same. As shown in the drawing (Fig. 49), the bottle consists of two parts, the one a container of the usual form, the other a glass cap into which the stopper is fused and is accurately fitted by grinding so as to extend completely into the neck of the container. The edges of the cap, which are carefully ground and polished, are accurately fitted into a groove ground into the shoulder of the bottle, so that when the stopper is inserted into the neck the two parts are hermetically joined and contamination with dust is absolutely pre-

FIG. 49.



New Reagent Bottle.



vented. The improved bottle is supplied by the firm of Franz Hugershoff, Leipzig.—*Pharm. Ztg.*, lviii (1913), No. 86, 861.

#### MISCELLANEOUS SUBJECTS.

**Commercial Disinfectants.**—*Ideal Requirements.*—D. N. Robin, Ph.G., states the ideal requirements of a commercial disinfectant as being:

- |                    |  |
|--------------------|--|
| It should have:    | 1. High germicidal power.                        |
|                    | 2. Stability in presence of organic matter.      |
|                    | 3. Homogeneous composition.                      |
|                    | 4. Ready solubility in all proportions in water. |
| It should be:      | 5. Non-poisonous.                                |
|                    | 6. Non-corrosive.                                |
| It should possess: | 7. Power of penetration.                         |
|                    | 8. Economy in cost.                              |
|                    | 9. Power to deodorize.                           |
|                    | 10. Power to remove dirt or grease.              |

He gives the extravagant cost of some of the advertised disinfectants of the market, computing such costs on the basis of their phenol coefficients.—*Proc. Penn. Phar. Assn.*, 1913, 359-362. (E. C. M.)

**Standardization of Disinfectants.**—W. A. Puckner says that in the examination of disinfectants it is necessary that due attention be paid to certain factors which have an important bearing on the results to be obtained, among these factors being the test organism, the temperature of the experiment, the proportion of culture to disinfectant, the amount of inoculation in subculture tubes, the media for subculture and organic matter. Neglect of attention to these factors will necessarily result in misleading results. There are at the present time three methods that may be given consideration: the Rideal-Walker Method, the Lancet Method and the Hygienic Laboratory Method. The latter method is coming into favor within the United States and will probably supplant the other methods for the standardization of disinfectants in this country.—*J. Am. M. Assoc.*, v. 60, 1316. (M. I. W.)

**Disinfectants.**—*The Phenol Coefficient Method of Testing.*—Joseph W. England, Ph.M., contributes an interesting and instructive paper upon this most important subject. This method of testing disinfectants, he says, apparently marks a distinct step forward in methods of testing disinfectants, but while it has important possibilities, it has its limitations. While it may serve

to determine the relative germicidal value of similarly prepared preparations of a coal-tar nature, it is not applicable for ascertaining real or relative values of other disinfectants of a different chemical value. Many antiseptics are insoluble in water and cannot be tested until made soluble, and even then, if such a test could be made, it would not represent the body conditions under which such antiseptics act. Iodoform is a striking example. It is insoluble in water. Hehn and Rosving state that sterilized iodoform jelly when inoculated with micro-organisms was found to be full of them, all growing freely on the third day. Ten per cent. of iodoform does not check putrefactive change in the pancreas. But it is an unquestioned clinical fact that iodoform applied to a body wound prevents putrefaction and promotes granulation and cicatrization, and this is probably because the wound secretions decompose the iodoform into iodine products that cause sterility, and what is true of iodoform as an antiseptic in the treatment of wounds, is probably true of other insoluble antiseptics.

Hydrogen peroxide is one of the most largely used antiseptics, and yet its germicidal powers are so weak that the determination of its coefficient is admittedly impracticable.

The Hygienic Laboratory Method of standardizing disinfectants is not a perfect method, but its use within certain limits will do much to standardize a very variable group of commercial products.—Proc. Penn. Phar. Assn., 1913, 300-304. (E. C. M.)

**Disinfection by Formaldehyde and by Sulphur.**—Disinfection with vapors of formaldehyde is regarded as a most efficient method of disinfection at present.—J. Am. M. Assoc., 1913, v. 61, 2261. (M. I. W.)

**Assay Processes for Pharmacists.**—*Simple Methods.*—R. Albro Newton, Phar.D., describes the simpler processes of assaying some of the official preparations and gives some "practical pointers" of use to the pharmacist in making such assays. He says that "stripped of their frills and furbelows most of the official volumetric manipulations are not nearly so difficult as is the making of a good egg-phosphate."—Proc. Mass. Phar. Assn., 1913, 128-130. (E. C. M.)

**Ash Determinations.**—*Value in Detecting Adulterations.*—Arthur W. Reum says that the ash content of drugs and spices has recently come into prominence as a test of their purity. It affords the means of detecting the presence of sand, earthy matter and even indicates an excess of stens, woody fiber, or adulteration

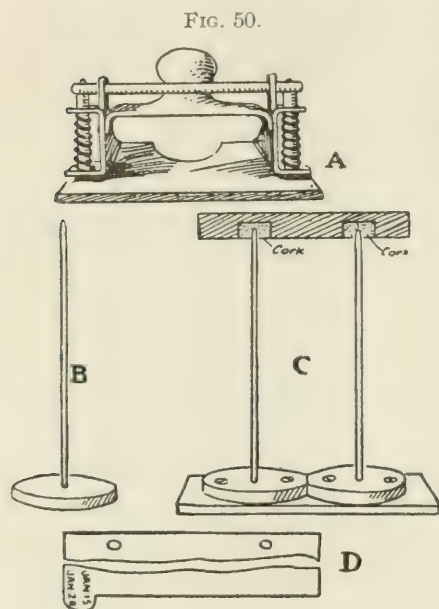
with another article having a different percentage of ash. This method is particularly of value in the testing of powdered drugs and as druggists and pharmacists purchase drugs largely in that condition, this method of assay should be of great value to them. A most suitable method for determining the ash and one which the writer has found very convenient is to char the drug in a tared crucible, in the open air, and to incinerate at as low a temperature as possible, starting moderately and heating gradually until the substance is completely ashed. The crucible is then placed in a desiccator and weighed. When the weighing is made to one-tenth milligram the use of logarithmic tables shortens very much the calculation of the per cent. If exactly 1 gram is ashed, the weight of the residue in centigrams equals the per cent. It is a positive fact, he says, that the ash content of a pure drug is a constant factor and any noticeable variation from this factor is an indication of poor quality or adulteration. The paper is accompanied by tables containing the ash content of many drugs. —Proc. Cal. Phar. Assn., 1913, 66-69. (E. C. M.)

**"Insurance Dispensing."**—*New British Regulations.*—Introducing the first of a series of editorials on "Insurance Dispensing," following in weekly sequence in five numbers of the "Chemist and Druggist," the editor says: "The chemists of Great Britain have now entered upon the fourth quarter of the first year of dispensing under the National Insurance Act. That Statute made a new epoch in the practice of British pharmacy, in so far as it transferred from the greater number of medical practitioners to pharmacists, the dispensing of medicines. A new epoch, new conditions, and new machinery; many difficulties, many doubts, and many forebodings, but the machinery, new though it be, has worked on the whole so smoothly that it seems as if insurance dispensing had always been with us. Difficult also is it to realize that when the year opened a cloud of uncertainty still hung over the trade. The Act had become law on December 16, 1911; it came into force on July 15, 1912, and Medical Benefit became available on January 15, 1913. Although the Act provides that no arrangement shall be made with a medical practitioner under which he is bound or agrees to supply drugs or medicines to insured persons, this is accompanied by the qualification 'except as may be provided by regulations made by the Insurance Commissioners.'" These editorials deal very thoroughly with the entire question in its relation to pharmacy and medicine under the following sub-headings: (1) Retrospect and Prospect, October 18;

(2) Renewals for 1914, October 25; (3) Fresh Considerations, November 1; (4) Pharmaceutical Committees, November 8; (5) Scotland—and the Rest, November 15; (6) Regulations, revision, November 22, 1913.—Chem. and Drugg., October 18 to November 22, 1913.

**Prescription Filing.**—*Convenient and Economical System.*—J. Barker describes what he designates "A Shilling Prescription Filing System," which, while intended for the method of filing

adapted to conditions prevailing in Great Britain, under the so-called "Insurance Dispensing," offers some suggestions that may prove useful for American methods. The requisites, which are shown by the accompanying cut (Fig. 50) are: *A*, a punch, such as is used for the ordinary system of filing papers; *B*, a single counter file, of the ordinary form; *C*, a double file, constructed of two ordinary counter files by fastening them to a board in such manner that the points are *exactly* coincident with the perforations produced by the punch *A*—the points being inserted



Prescription File.

into good corks forced into holes bored into a square piece of wood at the proper distance apart, this forming the head of the double file and protecting the prescriptions from slipping off when referring back to them; *D*, pieces of white cardboard, slightly larger than the form, with a thumb index tab (cut progressively higher), on which the date of a week's prescriptions is indicated. When a convenient number of prescriptions (a month's or quarter's) have thus been transferred to the double-file, they are slipped off, threaded with strong thin string, and tied tightly; a strip of thick brown paper is glued up to the edge at the back, followed by a paper cover, and the "book" so produced properly labeled.—Chem. and Drugg., February 8, 1913, 34.



**Prescription Problems.**—Mr. Addison Dimmitt contributes an interesting paper on this subject, with suggestions of methods for preparing a number of prescriptions which offer some difficulties in proper compounding. *Proc. Kentucky Phar. Assn.*, 1913, 90-93. (E. C. M.)

## C—PREPARATIONS

### AQUAE.

**Camphor Water.**—*Method of Preparation.* John K. Thum, Ph.G., criticizes the U. S. P. formula for this preparation. He says that it is not a permanent preparation and that most of the camphor used in its preparation by the official formula remains upon the filter. He suggests the following method as effectual in making an efficient, permanent and perfectly satisfactory water:

Camphor (in small pieces).....	8 Gm.
Distilled water ad.....	1000 Cc.

Mix.

He says that this water remains clear indefinitely and that by mixing equal volumes of the water and a 50% solution of magnesium sulphate, it may be easily determined that the water is saturated with camphor.—*Proc. Penn. Phar. Assn.*, 1913, 363-4. (E. C. M.)

**Camphor Water.**—*Preparation for Hypodermic Use.*—H. Leo recommends camphor water in place of camphorated oil for subcutaneous or intravenous injection. For this purpose the camphor water is prepared by direct solution of finely powdered camphor in water (or Ringer's solution) by continuous agitation. So obtained the cold, saturated camphor solution contains 1 part of camphor in 490, or in rounded figures 2%; it is placed in the incubator for some time in a well-stoppered bottle, then filtered and preserved for use in well closed containers. In use, an adequate quantity of the water is heated in a small closely stoppered container (weighing bottle) to body temperature and quickly drawn into the hypodermic syringe to prevent the loss of camphor by evaporation. In this connection the author made the interesting observation that the camphor water, saturated at the ordinary temperature, becomes turbid when heated to 40°, proving that camphor is less soluble in warm than in cold water. This turbidity, however, is manifested only in closed bottles, because when heated in an open container the camphor is vaporized as fast as it separates.—*Pharm. Ztg.*, lviii (1913), No. 27, 267; from *D. Med. Wschr.*, 1913, No. 13.

**Cherry Laurel Water.**—*Influence of Period of Collection of Leaves on Its Strength.*—In continuation of his studies on the constituents of cherry laurel water, A. Jouillet reports that the content of active constituents depends materially on the age and period of collection of the leaves. The strongest preparation is obtained by the distillation of fresh leaves collected in May. Cherry laurel water prepared from such leaves contained in the liter 2.03 Gm. of HCN and 8.5 Gm. of benzaldehyde, while a liter of water distilled from leaves collected in July following, contained only 1.01 Gm. of HCN and about 3.5 Gm. of benzaldehyde; and water distilled from older, stored leaves contained very much less.—Pharm. Ztg., lviii (1913), No. 82, 821; from Journ. de Pharm. et Chim. (7) viii (1913), No. 6.

**Cherry Laurel Water.**—*Solubility of Volatile Constituents.*—According to the investigations of A. Astruc and A. Jouillet, the solubility of the benzaldehyde in cherry laurel water increases in direct proportion to the content of hydrocyanic acid in the preparation.—Pharm. Ztg., lviii (1913), No. 73, 729; from Journ. de Pharm. et Chim. (7), viii (1913), No. 4.

**Cherry Laurel Water.**—*Incompatibility with Sodium Metharsinite.*—A. Labat observed that a solution containing sodium metharsinite (arrhenal), 0.50 Gm., and cherry laurel water, 10 Gm., which was quite clear when made, became opaque within twenty-four hours; a yellowish flocculent, or rather curdy deposit was gradually formed, while the supernatant liquid remained turbid, with the appearance of a colloidal solution. Thinking that there might be some analogy between this reaction and that which occurs in the case of Bougault's reagent and arrhenal, the following solution was made: Arrhenal, 0.50 Gm.; saturated aqueous solution of benzoic aldehyde, 10 Gm. Some hours after this was made, a deposit exactly similar to that described had formed. The cause of the reaction has not yet been ascertained by the author, but he finds that dilution obviates, or seems to obviate, the incompatibility, as in the following solution, which remains clear: Arrhenal, 0.50 Gm.; cherry laurel water, 10 Gm.; distilled water, q. s. to make 125 Gm. Sodium cacodylate behaves in the same way.—Pharm. Journ. and Pharmacist, April 5, 1913, 469; from Bull. Soc. Pharm. de Bord., February, 1913, 63.

**Soda Water.**—*The Deterioration Due to Micro-Organisms.*—N. O. Sherwood and C. C. Young have examined a number of

samples of soda water that have "gone bad," and state that such spoiled beverages may be divided into three classes:

(1) Stringy pop, (2) pop with sediment and turbidity, and (3) pop in which sufficient fermentation had developed to blow off the caps or break the bottles.

Stringy pop was found to be due to a one-celled alga "Tetraspora," and was found to be derived from an infected water supply.

Pops in which a sediment or turbidity had developed were found to contain large numbers of yeast cells, 30,000 to 45,000 per Cc., the sediment being composed of yeast cells. Several strains of bacteria were isolated and studied.—*Journal Ind. and Eng. Chem.*, July, 1913, 577. (L. A. B.)

#### CAPSULA.

**Filled Capsules.**—*Method of Cleaning.*—F. W. Nitardy mentions a method which he has found useful for cleaning capsules that have been filled with certain powders having a tendency to adhere to them. Shaking them in or rubbing them with a towel will not clean them. They are, however, easily made bright and clean by placing them in a dish with a quantity of sodium bicarbonate, stirring, and separating the sodium bicarbonate by means of a sieve, then finishing by shaking them in a towel.—*Journ. A. Ph. A.*, March, 1913, 320.

#### CATAPLASMA.

**Cataplasm of Kaolin.**—*Manipulation.*—S. K. Sass observes that many pharmacists consider the preparation of cataplasm of kaolin too difficult to make on the small scale of a retail pharmacy. He finds, however, that by manipulating as follows, it can be prepared satisfactorily with little labor: Procure a large candy pail or something similar, fasten a piece of board about thirty-six inches long and ten to twelve inches wide to the bottom of it by hinges, hooks or otherwise, or fasten the pail to the floor. Order from a carpenter or prepare yourself a stick thirty inches long, or longer, the longer the better, and at least one inch thick. This done, you are ready to begin the work.

Kaolin should be free of moisture. To assure yourself that it is perfectly dry, heat as directed in the *Pharmacopœia*. The pail, too, must be thoroughly dry. Add the boric acid to the glycerin and heat to about 150° C., remove from the fire and pour into the pail, add the kaolin and stir until it becomes a smooth mass, free of lumps. Then dissolve the thymol in the oils and mix well with the mass. Finally add enough glycerin to bring

the cataplasm to the proper consistency and transfer to an air-tight container. Mr. Sass finds it necessary to add more glycerin than the pharmacopœial formula calls for.—*Journ. A. Ph. A.*, June, 1913, 697-699.

#### ELIXIRIA.

**Elixir aromaticum.**—*Elixir aromaticum* serves the purpose of concealing the taste of many otherwise unpalatable preparations. If it is desired to add a red coloring, this can be done by the use of tincture of cudbear. *Elixir adjuvans* can also be used for purposes of a vehicle, but it must be remembered that it is incompatible with acids.—*J. Am. M. Assoc.*, v. 60, 309. (M. I. W.)

**Elixir Aurantii, U. S. P.**—*Manipulation.*—J. J. Passehl suggests that the following manipulation will save much time in the manufacture of this preparation: Mix the compound spirit of orange with the purified talcum, add the distilled water and proceed as in making any aromatic water from essential oil; then mix the syrup and alcohol in a graduated bottle and after filtering a small amount and returning the filtrate until clear, place the funnel in the graduated bottle containing the syrup and alcohol and pour on the remainder of the mixture of compound spirit of orange, talcum and water, and finally add water through the filter to make the required amount of elixir.—*Proc. Wis. Phar. Assn.*, 1913, 57. (E. C. M.)

**Elixir Gentian, N. F.**—*Improved Formula.*—Thomas D. Halliday says that by using the equivalent quantity of extract gentian for the fluidextract gentian directed in the formula of Elix. Gentian, N. F., the necessity for de-tannating the gentian is avoided and the making of the elixir much facilitated.—*Proc. Md. Phar. Assn.*, 1913, 92-93. (E. C. M.)

**Elixir Phosphates of Iron, Quinine and Strychnine.**—*Improved Formula.*—George M. Beringer recommends the following improved formula for this preparation:

Soluble ferric phosphate.....	17.5	Gm.
Potassium citrate.....	5	Gm.
Quinine.....	8.75	Gm.
Strychnine.....	0.275	Gm.
Phosphoric acid.....	2	Cc.
Alcohol.....	200	Cc.
Glycerin.....	200	Cc.
Compound spirit of orange.....	10	Cc.
Purified Talc.....	30	Gm.
Distilled water, a sufficient quantity to make....	1000	Cc



Dissolve the quinine and the strychnine in the alcohol and 100 Cc. of distilled water to which has been added the phosphoric acid. Add to this the compound spirit of orange. Dissolve the ferric phosphate and the citrate of potassium in 100 Cc. of warm distilled water. To this solution add the glycerin and then the alkaloidal solution and sufficient distilled water to make the product measure 1000 Cc. Mix the purified talcum immediately with the liquid and then filter, returning the first portion of the filtrate until a transparent liquid is obtained. Lastly, wash the filter with a mixture of one volume of alcohol and four volumes of water until the filtered product measures 1000 Cc. The green tint of the product as at first prepared appears to undergo no marked change after keeping for a year or more. The manipulation is an important factor in obtaining a satisfactory product and a reversal of the directions as to mixing would probably demonstrate this fact.—Proc. N. J. Phar. Assn., 1913, 83-84. (E. C. M.)

**Elixir of Iron, Quinine and Strychnine Phosphates.**—*Improved Manipulation.*—In making this pharmacopœial preparation, R. J. Fritzinger suggests that much time is saved, if a graduated bottle of the required size be used, the graduations made to mark the point to which each successive addition of material will reach. The ammonium acetate solution should be started in the evening by adding the ammonium carbonate, in lumps, to the acetic acid allowing the reaction and solution to take place over night. Unfiltered aromatic elixir should be used, as the filtered is quite likely to be deficient in alcohol because of evaporation occasioned by the repeated returning of the filtrate in the endeavor to obtain a bright and clear product.—Natl. Drug., April, 1913, 137-138. (C. M. S.)

**Elixir of Phosphate of Iron, Quinine and Strychnine, U. S. P.**—*Change in Color when Exposed to Light.*—Three samples of this elixir were kept for four months, exposed to the ordinary light of the laboratory as an experiment by Wm. S. White. No. 1, made by the U. S. P. method, changed to a light brown color. No. 2, to which 4 grains of potassium carbonate was added per ounce, changed to dark brown. No. 3, to each ounce of which 4 minims of hydrochloric acid was added, remained unchanged.—Journ. A. Ph. A., August, 1913, 939.

#### EXTRACTA.

**Solid Extracts.**—*Expeditious Method of Determining Moisture.*—O. Anselmino describes an expeditious and convenient method

of determining the water content of solid extracts, for which purpose the glass discs shown by Fig. 51 are used. About 1.5 Gm. of the extract are accurately weighed on one of the previously



FIG. 51.  
Moisture Determiner for  
Solid Extracts.

weighed discs, which is placed in the drying oven until the extract is softened, and then spread out in a very thin layer upon its surface by the aid of the second disc, the weight of which is also known. The two discs are then drawn apart laterally and placed into the drying oven. When dry, the discs are placed upon each other so as to enclose the dried mass, placed into an

exsiccator to cool, and weighed. The method has been found accurate within 0.3 per cent. of actual moisture. These discs are supplied by Warmbrunn, Quilitz & Co., Berlin.—Pharm. Ztg., lviii (1913), No. 94, 939.

**Extractum Ferri Pomati.**—*Assay of Iron.*—The assay of the German Pharmacopœia being found unsatisfactory, K. Kropat tried other methods and found that treatment of watery extract with permanganate-sulphuric acid mixture gave a clear ferric solution which after treatment with potassium iodide, and by hydrochloric acid could be titrated with N. 10 thiosulphate V.S. To obtain accurate results, an excess of permanganate must be avoided, as excess of resulting manganese dioxide, even though removed with hydrogen or with oxalic acid, means misleading figures. His recommended process consists of dissolving 1 Gm. *Extractum Ferri Pomati* in 30 Cc. diluted sulphuric acid under gentle heat, adding to the cooled solution 1 Gm. of very finely powdered potassium permanganate, agitating 1 2 minutes, warming 2 3 minutes on a boiling water bath, then letting stand until there is left a bright yellow ferric solution containing little or no manganese dioxide residue. To the cooled solution is then added 2 Gm. potassium iodide and after an hour's standing it is titrated with N. 10 thiosulphate V.S. Of this, at least 9 Cc. (representing 5% of iron) should be needed.—Arch. d. Pharm., 251 (1913), No. 2, 90. (H. V. A.)

**Extract of Meat (Bouillon Cubes.)**—*Question of Standardization.*—H. Wieland doubts the practicability of standardizing bouillon cubes on the basis of their extract of meat content, as has been proposed, since we have no reliable method for the quantitative and, under circumstances, even the qualitative estimation of the

extract contained in them. The well-known color reactions of the essential content of meat extract, creatin and creatinin, with pieric acid are also given by other substances, and these substances might for fraudulent purposes be incorporated with the bouillon cubes, thereby nullifying the analytical control. The author then considers the practicability of the technical production of creatin and creatinin, which might be used as economical substitutes for the expensive meat extract; but, after all, the valuation of bouillon cubes as a nutrient is primarily dependent on the agreeable taste and good accommodation when used as food, and even the fixation of a nitrogen minimum is not advisable.—Pharm. Ztg., lviii (1913), No. 84, 840; from Konserv.-Ztg., 14 (1913), No. 32.

**Extract of Opium, Ph. Fr.**—*Removal of Insoluble Resinous Matter by the Official Process.*—In the official process of the French Pharmacopœia for extract of opium the soft, aqueous extract first obtained by evaporation is ordered to be redissolved in ten times its weight of water and then filtered in order to remove insoluble resinous matter. P. Carles, however, shows, in the first place, that this so-called "resin" is mainly an oxidation product. When the extraction liquid of a sample of opium was divided into two parts, and one was evaporated on the water bath, the other under reduced pressure at 40° to 80° C., the latter gave scarcely any insoluble "resin." The amount of resin separated from opium liquor evaporated in the ordinary way amounts to 3.5 per cent. of the original drug. In the second place, the author finds that this resin contains a notable amount of morphine and yet more narcotine. The total amount of morphine present amounts to 27 per cent., or a higher percentage than is contained in the completed extract. This morphine may be removed by successive trituration of the powdered "resin" with water. The insoluble residue thus obtained is very rich in narcotine. These results point to the desirability of evaporating *in vacuo* the extraction liquors of opium preparations. Since the method of the French Pharmacopœia does not exhaust the opium of its morphine in the first stage of the process, and then loses a considerable quantity in the middle stage, it is obviously a process that requires pharmaceutical amendment.—Pharm. Journ. and Pharmacist, October 11, 1913, 533; from Journ. de Pharm. et Chim., 1913, 8, 250.

## FLUIDEXTRACTA.

**Fluidextracts.**—*Valuation on the Basis of Dry Residue of Evaporation.*—Fr. Schwikkard directs attention to the necessity



of increasing the list of fluidextracts in future editions of the G. P. and particularly to the methods of their valuation, a problem which presents many difficulties since in many cases the sole criterions of quality are of a physical nature, depending mainly on specific gravity, and the content of dry extract and of ash. Unfortunately, there exists so much variability in the amount of extractive matter in different samples of the same drug that it becomes practically impossible to fix a definite percentage of dry extract so long as the finished fluidextract is required to represent an equal weight of the drug. If, however, an average content of dry extract is selected, fluctuating within narrow limits, and irrespective of the proportions of weight of fluidextract for weight of drug, the valuation of a fluidextract that cannot be assayed on the basis of the active constituents becomes quite possible. Thus, for example, the author has found the lowest extract content in fluidextract of ergot to be 14.29 per cent.; the highest 23.41 per cent. Obviously this is too wide a range and intermediate (average) values should therefore be selected, which in this case would properly be taken as 17.5 to 19.5 per cent. If the fluidextract contains less than 17.5 per cent. of extractive, it should be concentrated until it shows that percentage, while when the percentage is over 19.5 per cent., it should be correspondingly diluted. The result of this expedient, while not as satisfactory as the actual assay of active constituents, would have the advantage of at least approximately uniform therapeutic activity, and would be in line with the actual assay method in so far as the adjustment of the finished fluidextract is concerned.

The author, in collaboration with Dr. Otto Haars, has made the following determinations of sp. gr., residue of evaporation and ash in fluidextracts of their own preparation, in most cases in numerous examples, giving the averages in accordance with his above suggestion when practicable:

**Extr. Aurantii fl., G. P. V,** in four examples: sp. gr., 1.025; dry residue, 28.27; ash, 0.73 per cent.

**Extr. Cascaræ Sagradæ fl., G. P. V,** in six examples: sp. gr., 1.052; dry residue, 22.88; ash, 0.69 per cent.

**Extr. Cascaræ Sagradæ examarat. fl.:** sp. gr., 1.027 to 1.034; dry residue, 18.76 to 22.33; ash, 1.32 to 1.75 per cent.

**Extr. Chinæ fl., G. P. V,** in five examples: sp. gr., 1.062 to 1.096; dry residue, 25.13 to 31.94; ash, 1.23 to 1.97; alkaloid, 3.94 to 6.45 (average, 5.04) per cent.



**Extr. Condurango fl., G. P. V.**, in eight examples: sp. gr., 1.02 to 1.05; dry residue, 15 to 18; ash, 1.0 to 1.5 per cent.

**Extr. Granati fl., G. P. V.**, in one example: sp. gr., 1.023; dry residue, 16.22; ash, 0.49; alkaloid, 0.201 per cent.

**Extr. Hamamelidis Virg. fl., G. P. V.**, in three examples: sp. gr., 1.034 to 1.053; dry residue, 21.79 to 23.53; ash, 1.57 to 1.88 per cent.

**Extr. Hydrastis Canad. fl., G. P. V.**, in eleven examples: sp. gr., —; dry residue, 18.7 to 20.5; ash, 0.52 to 0.99; alkaloid, 2.2 to 3.1 per cent.

**Extr. Plantaginis fl., menstruum 3 alcohol, 7 water:** sp. gr., 1.071; dry residue, 22.06; ash, 4.5 per cent.

**Extr. Secalis Cornuti fl., G. P. V.**, in twelve examples: sp. gr., highest, 1.077, lowest, 1.037; dry residue, highest, 23.41, lowest, 14.29; ash, highest, 3.06, lowest, 1.72 per cent.

**Extr. Simarubæ fl., G. P. V.**, in one example: sp. gr., 0.978; dry residue, 6.07; ash, 0.88 per cent.

**Extr. Thymi fl., G. P. V.**, in an average of thirty-two examples: sp. gr., 1.05; dry residue, 20.39; ash, 1.99 per cent.

The author contemplates similar determinations in the more important fluidextracts, such as *Cocæ*, *Colæ*, *Gossypii*, *Matico*, *Maydis stigmata*, *Myrtilli*, *Piscid. erythrin.*, *Rhei*, *Rhois aromat.*, *Sarsaparille*, *Senegæ*, *Taraxici*, *Uvæ ursi*, *Valerianæ*, *Viburni prunifolia*.—Pharm. Ztg., lviii (1913), No. 37, 368.

**Alkaloidal Fluidextracts.**—*Notes on the LaWall Process of Assay.*—H. W. Jones records the results obtained by the application of the LaWall process for the assay of alkaloidal fluidextracts (see Year Book 1912, 40) to the following fluidextracts: Guarana, Veratrum viride, Kola, Henbane, Stramonium, Belladonna (leaves and root), Pilocarpus, Ipecac, Aconite and Coca. The first trials were somewhat disappointing, especially when chloroform was used as a solvent, as the density of the saline solution was so near that of the solvent that difficulty was experienced in obtaining a rapid separation of the two liquids. The author finally adopted the plan suggested by Prof. Sayre in his paper on fluid extract of gelsemium (see Year Book, 1912, 42) of replacing the salt solution with 2 per cent. sulphuric acid and obtained results comparable in every case with those obtained by the longer

processes. In conclusion, the author is convinced of the utility of the LaWall process, especially when applied to those fluid-extracts which are most prone to form emulsions in the regular methods of procedure or to fluidextracts which are liable to loss by heating for the removal of alcohol.—*Journ. A. Ph. A.*, October, 1913, 1257-1259.

**Fluidextracts of Cascara and Frangula.**—*Comparative Valuation.*—Dr. E. Amort and Dr. W. Rothe, staff apothecaries in the Prussian War Department, have subjected a series of fluidextracts of cascara and frangula, both of their own manufacture and obtained on the market, to comparative examination, with results which lead them to suggest the following minimal values for these preparations when made in accordance with their official formulas:

	Fluidextract of	
	Cascara.	Frangula.
Specific gravity, not less than.....	1.05	1.03
Residue of evaporation, not less than.....	23.00	17.00
Ash, not more than.....	1.00	1.00
Precipitate with water, not below.....	1.50	0.75
Precipitate with tannin, not below.....	3.00	1.00
Shaking out with ether, not below.....	0.90	0.80
Shaking out with acetic ether, not below.....	2.00	1.50
Shaking out with chloroform, not below.....	0.75	0.50
Shaking out with amyl alcohol, not below.....	3.00	2.00
Shaking out with isobutyl alcohol, not below.....	5.00	3.30
Shaking out with phenol, not below.....	7.50	4.50

The authors consider such an examination necessary when dealing with these preparations purchased on the market, but that the most satisfactory assurance of their quality is their manufacture by the pharmacist in his own laboratory from material of his own selection, which not alone avoids the necessity for examination but is in the end more economical. —*Pharm. Ztg.*, lviii (1913), No. 54, 532.

**Extr. Chinæ Fluid., Ph. Austria.**—*Modification to Make a Clear Water-Miscible Preparation.* The Austrian Pharmacopœia requires that fluidextract of cinchona prepared according to the official formula should give a clear mixture with water, a requirement which according to the investigations of Konstantin Kollo cannot be fulfilled, owing to the presence of a considerable quantity of phlobaphenes in the finished product. The presence of these is attributable to their ready solubility in water containing

tannic acid and may be avoided by the conversion of the cinchotannic acid contained in the drug as completely as possible into cinchona red. This may be accomplished, 1, by increasing the quantity of hydrochloric acid, and 2, by the evaporation of the percolate so as to accelerate the oxidation. The first of these conditions is provided by the formula of the G. P. V; the second by the process of the Pharm. Nederland IV. A product that will form a clear mixture with water may therefore be obtained by operating at first according to the G. P. V formula, then evaporating the first percolate and the successive exhaust percolates separately to small volumes and, after uniting them, diluting the concentrated liquids to about 80 parts with water, adding 2 parts of hydrochloric acid, 10 parts of alcohol, 10 parts of glycerin and enough water, to make 100 parts of fluidextract. For the industrial production of a fluidextract that will produce a clear mixture with water, the author however suggests the following process:

Two parts of lime prepared from marble are converted into milk of lime and diluted with sufficient water to form a magma with 100 parts of powdered cinchona. The mixture is heated on a water bath, a little ammonium carbonate being added in order to convert any unchanged  $\text{CaO}$  remaining into  $\text{CaCO}_3$ . The mixture is then dried and extracted with 68 to 70% alcohol and the alcohol is completely recovered by distillation, leaving between 25 and 30% of dry extract. The dry extract is then assayed and the calculated quantities of water and diluted hydrochloric acid being incorporated to make 100 parts of fluidextract containing about 6% of alkaloid and 10% diluted  $\text{HCl}$ , the mixture is well kneaded and set aside, occasionally kneading, for 3 or 4 days. The mixture is now filtered, the filtrate is again assayed, again allowed to stand several days, and finally adjusted to a 4% alkaloidal strength by the addition of glycerin, alcohol and water in the proportions prescribed for the finished fluidextract. By this method the resinous residue retains considerable alkaloid, but may be utilized for the preparation of the alcoholic extract.—Pharm. Ztg., lviii (1913), No. 29, 289; from Pharm. Prat. 1913, No. 2.

**Fluidextract of Cinchona.**—*Improved Formula.*—Comprehensive experiments lead M. J. Warin to recommend the following formula and process for preparing an active fluidextract of cinchona, without glycerin, which is miscible with water and alcohol, forming perfectly clear mixtures, whereas the presence of glycerin, though retarding the precipitation of alkaloids by cold,

interferes with their titration and, favoring the solution of resins, produces turbidity on admixture with water: 500.0 Gm. of the powdered bark are moistened with 300.0 Gm. of a menstruum composed of 2000.0 Gm. of water and 65.0 Gm. diluted hydrochloric acid, and allowed to stand 2 hours. It is then transferred to a non-metallic percolator, the remainder of the menstruum is poured on gradually, and the orifice of the percolator closed when the percolate begins to drop. After standing 48 hours, percolation is allowed to proceed, drop by drop, and continued with a mixture of 4000.0 Gm. of water and 10.0 Gm. diluted hydrochloric acid until the bark is exhausted. The percolate is evaporated to 400.0 Gm., 25.0 Gm. diluted hydrochloric acid are added, stirred, and allowed to stand. Finally, 60.0 Gm. of alcohol are added, the mixture is shaken, adjusted with water to 500.0 Gm., and filtered if necessary.—Pharm. Ztg., lviii (1913), No. 56, 551; from Journ. de Pharm. et Chim., 1912, No. 12.

**Fluidextract of Hydrastis.** *Deterioration.* Dr. Kunze has found that the fluidextract containing 2.86 per cent. of hydrastine, upon keeping for one year, contains only 2.19 per cent. He seems to be under the impression that a higher alcoholic menstruum should be used, or that an addition of 0.1 to 0.2 per cent. of tartaric acid should be made in order to prevent the separation of hydrastine. It is also well not to keep too large a supply of fluidextract of hydrastis.—Apoth. Ztg., 1913, No. 25, 223. (O. R.)

**Fluidextract of Hydrastis.** *Tests of Identity.* C. Gluecksmann recommends the following tests:

1. Berberine: One drop of the fluidextract dissolved in 10 Cc. of hydrochloric acid and mixed with one drop of hydrogen peroxide, develops within five to ten minutes a violet coloration which remains permanent even upon the addition of hydrochloric acid.

2. Hydrastinine: Five drops of the fluidextract are mixed with 5 Cc. of a 5 per cent. solution of sodium bicarbonate and are then agitated with 10 Cc. of ether. After washing the ether layer with 5 Cc. of water and filtering, it is evaporated. The residue is dissolved with 10 Cc. diluted sulphuric acid and 10 to 15 drops of a one per mille solution of potassium permanganate are added. Upon agitation, the solution is decolorized. When diluted with 5 volumes of distilled water, the solution appears colorless, but shows a distinct blue fluorescence in reflected light.—Suedd. Ap. Ztg., 1913, No. 83. (O. R.)



## GLYCERITA.

**Glycerin Tragacanth.**—*Formula.*—G. Pégurier recommends the following formula for a tragacanth jelly to be used on surgical instruments, etc.

Tragacanth, in powder.....	2 Gm.
Glycerin.....	50 Gm.
Distilled water—to make.....	100 Gm.

Agitate the tragacanth and water and repeat this several times during one hour. Then add the glycerin and strain the mixture with slight pressure through double thickness of gauze. The preparation is then sterilized during 15 minutes at 120° C. —Répert. Pharm., 1912, 24, 246. (O. R.)

## INFUSA.

**Concentrated Ipecacuanha Infusions.**—*Deficiency in Alkaloid.*

C. Mannich and W. Dühr contribute the results of an interesting study undertaken in order to eliminate the conflicting claims regarding the value of concentrated infusions of ipecacuanha for the extemporaneous preparation of the regular infusion. Their experiments were extended to a number of concentrated infusions found on the market as well as to such of their own make, and also to *Infusa Ipecacuanha sicca*. The results are summarized as follows:

In an infusion of ipecacuanha prepared *lege artis* about  $\frac{3}{4}$  of the alkaloids of the root are represented.

An infusion prepared from a concentrated infusion of ipecacuanha, made according to the formula of Dieterich, contains only about  $\frac{2}{3}$  as much alkaloid as is contained in the infusion prepared *lege artis*.

All the *Infusa Ipecacuanha sicca* were woefully deficient in alkaloid, and should therefore under no circumstances be used to prepare the regular infusion. Pharm. Ztg., lviii (1913), No. 99, 989; from Ber. d. Pharm. Ges., 1913, No. 8.

**Infusions of Mate and Tea.**—*Differentiation.* P. de Lylle reports the following color reactions:

	Maté.	Tea.
Ammonia water.....	green color	red color
Solution sodium hydroxide.....	green color	yellow color
Magnesia mixture, lime water and solution of mercuric nitrate.....	green precipitate	brown precipitate
Solution silver nitrate.....	black precipitate	red precipitate
Ferric chloride.....	green precipitate	red precipitate

Ann. Chim. Analyt., 1912, 17, 84. (O. R.)

**A Cup of Tea.**—*Its Chemistry.*—Prof. R. R. D. Cline writes upon the chemistry of a cup of tea and contrasts the results obtained between an infusion made properly with a few minutes' brewing, and one made from identically the same materials and by the same process, but with a prolonged infusion of the leaves. He says that a three-minute infusion is enough to thoroughly exhaust the leaves of their aroma and caffeine, but that in a ten-minute infusion, the tannic and gallic acids are dissolved out of the leaves, and that these make the infusion not only unpleasant to the taste, but deleterious to the health. The author also says that in making *Infusum Digitalis*, a prolonged steeping is not required, and that the official process for making that preparation would be improved by directing the infusion of the leaves for a much shorter time than is now stipulated. The article is accompanied by complete tables showing the results of his experiments.—Proc. Texas Phar. Assn., 1913, 89-93. (E. C. M.)

#### LINIMENTA.

**Camphor Liniment.**—*Preparation by Circulatory Displacement.*—Although the process of circulatory displacement for dissolving camphor in oil is not new, the following suggestions by Mr. Wm. R. White may prove useful to pharmacists who have found trouble when following the official directions. He says that by powdering the camphor, putting it into a cheese-cloth bag, and suspending this in the oil, stoppering the bottle and shaking at intervals for two or three days, an excellent preparation, strictly U. S. P., is produced without loss of camphor by volatilization as in the U. S. P. method.—Journ. A. Ph. A., August, 1913, 940.

**Camphor Liniment.**—*Improved Method of Preparation.*—Otto Raubenheimer says that one of the quickest and simplest processes for producing a camphorated oil is circulatory displacement, by which the camphor is dissolved in a few hours, and which is doubtless used extensively by pharmacists all over the United States, and so by the author, who has always advocated this simple method, which requires no further attention and above all, which requires no heat. He now calls attention, however, to an improved process, that of percolation, which, in the course of his work on the revision of the U. S. P., Professor Chas. F. Nixon has developed, and which is conducted as follows: "Reduce the camphor to a coarse powder, and put it in a narrow glass percolator in which a layer of absorbent cotton has been placed. Pour on the oil till the camphor is covered and when the percolate begins to drop close

the lower orifice and allow to stand for 12 hours. Then percolate slowly till the required quantity is obtained."

Prof. Nixon justly claims that this simple process can be carried out in every pharmacy. Furthermore, it is evident that in this cold process there can be no loss of camphor by evaporation, as the same is dissolved before the required quantity of oil has passed. From numerous experiments the author can fully recommend the percolation process and the object of this paper is to make this process better known. *Journ. A. Ph. A.*, August, 1913, 937-938.

**Linimentum Capsici Compositum (Capsamol).**—According to F. Adolph Richter & Co., this well-known liniment has the following composition:

Capsicum.....	3	parts
Alcohol.....	44	parts
Camphor.....	1.5	parts
Ethereal oils.....	2.5	parts
Aromatic waters.....	40	parts
Medicinal soap.....	1	part
Ammonia water.....	8	parts

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To make..... 100 parts

*Ph. Zhalle.*, 1913, No. 18. (O. R.)

#### LIQUORES.

**Chlorine Water.**—*Care in Preservation.*—A writer in "*Südd. Ap. Ztg.*" finds that when chlorine water, of the proper strength originally (0.5% Cl), is preserved in small accurately stoppered and completely filled glasses, it will retain the required strength for a long time, but that after opening and removing a portion of the contents the percentage of active chlorine is rapidly reduced.—*Pharm. Ztg.*, lviii (1913), No. 19, 191.

**Liquor Cresoli Saponatus, G. P. V.**—*Economic Industrial Preparation.*—O. Schmatolla makes some interesting observations concerning the industrial manufacture of *Liquor cresoli saponatus*, G. P. V and gives directions for its economic preparation, together with a description of simple methods for testing its quality and for its valuation according to the official requirements.—*Pharm. Ztg.*, lviii (1913), No. 68, 676.

**Liquor Ferri Iodidi.**—*Formula for the Extemporaneous Preparation of Syrup of Ferrous Iodide.*—In the course of his pharmacopœial work, Geo. M. Beringer devised the following formula for a con-

concentrated solution of ferrous iodide for the extemporaneous preparation of a syrup which corresponds accurately with the requirements of the Syrup of Ferrous Iodide, U. S. P.:

#### LIQUOR FERRI IODIDI.

An Aqueous Solution Containing 107.8 Gm. of Ferrous Iodide  $\text{FeI}_2 = 309.69$  in Each 100 Cc.

Iron, in the form of fine, bright wire, cut into small pieces	250 Gm.
Iodine.....	884 Gm.
Hypophosphorous acid (50%).....	85 Cc.
(if 30% acid be used) then use.....	140 Cc.
Glycerin.....	100 Cc.
Distilled water, a sufficient quantity to make one thousand cubic centimeters.....	1000 Cc.

To the iron, contained in a flat-bottomed flask, add 1000 Cc. of distilled water, then gradually add the iodine, keeping the temperature down by setting the flask in a vessel of cold water. When the iodine has all been added, allow the mixture to stand for 12 hours, then heat to boiling until the clear liquid is of a bright green color. Then *cool* the solution and filter through a double filter paper, wash the flask and iron residue with several portions of distilled water and pass the washings through the filter. Add the glycerin to the filtered solution and rapidly evaporate in a porcelain dish on a sand bath to about 850 Cc. Allow the solution to cool to  $90^{\circ}$  C., then add the hypophosphorous acid; mix thoroughly and when cool add sufficient distilled water to make 1000 Cc.

The finished product should be kept in small glass-stoppered bottles entirely filled. It is an emerald-green liquid, specific gravity about 1.9 (actual determination of product gave 1.906).

Syrup of ferrous iodide made by diluting 1 volume of this liquid with 15 volumes of syrup (U. S. P.) showed a specific gravity of 1.35, thus practically tallying with the U. S. P. statement for specific gravity of the syrup of iron iodide, and maintaining it of the International Standard of 5 per cent. of ferrous iodide. The hypophosphorous acid is advisedly directed to be added to the concentrated iodide solution after it has been allowed to cool to  $90^{\circ}$  C. If it is added to the iron-iodide solution before concentration, the hypophosphorous acid is more or less decomposed.—*Journ. A. Ph. A.*, May, 1913, 597-600.

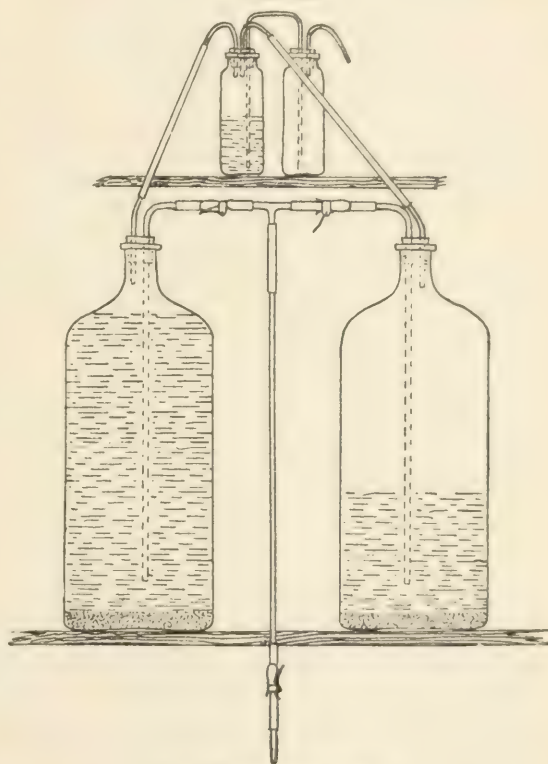
#### Lime Water.—*Practical Method of Preparation and Preservation.*

At the Denver meeting of the Association, F. W. Nitardy exhibited and described the advantages of the lime water apparatus



shown by Fig. 52, which is intended to do away with filtering or decanting the lime water into a second container, to protect it from the action of the air, and to insure a continuous and plentiful supply, which will always be a strictly U. S. P. product, with a minimum of labor or trouble. As shown, the apparatus consists of two bottles of suitable size connected by a "T" tube with a double syphon having one outlet. The bottles are stoppered to prevent entry of air except through the inlet tubes bringing

FIG. 52



Lime Water Apparatus.

air from a third bottle, half filled with concentrated potassium hydroxide solution through which the air must bubble before entering the supply bottles, thereby removing the  $\text{CO}_2$ , the fourth bottle being an expansion bottle to prevent the spilling of the  $\text{KOH}$  solution in case of back pressure through change of temperature. The syphon bottles are initially charged with a suitable quantity of a "Milk of Lime," consisting of well-washed slaked lime bottled in semi-liquid form and kept in well-sealed bottles for use as required, sufficient distilled water being added to fill them. They are then allowed to settle till the supernatant liquid is clear. The syphon is then put in place, the air tubes are connected, and the syphon started, one of the syphon arms being closed. The lime water may now be withdrawn as needed until the bottle is nearly empty, when the second bottle is brought into use, and

the first bottle refilled with distilled water, shaken, set back in place and allowed to settle.—*Journ. A. Ph. A.*, March, 1913, 319.

**Liquor Magnesii Citratis.**—*Modified Formula.*—John F. McNulty, Jr., suggests a modified formula for this preparation which obviates the previous manufacture of the syrup of citric acid of the official formula and which he says makes an unexceptionable preparation with a minimum of trouble and effort.

Carbonate of magnesia.....	150	Gm.
Citric acid .....	336	Gm.
Simple syrup.....	600	Cc.
Tr. fresh lemon peel.....	6	Cc.
Bi-carb. potass. in each bottle.....	2.5	Gm.
Water.....	a sufficient quantity	

Place the citric acid, carbonate of magnesia and tinct. lemon peel in a suitable container having a large orifice; add 1200 Cc. of water. Allow the reaction to proceed. When it is completed, filter the solution and add the simple syrup to the clear liquid and sufficient water to make 3650 Cc. Fill ten strong bottles with the solution, add 2.5 Gm. of bicarbonate of potass. to each bottle and stopper securely.—*Proc. N. J. Phar. Assn.*, 1913, 44-46. (E. C. M.)

**Volumetric Solutions of Potassium Hydroxide.**—*Increase in Strength on Standing.*—During the course of investigations on the keeping quality of standard volumetric solutions, Professor A. H. Clark noted a peculiar thing regarding the keeping of standard potassium hydroxide V. S., namely, that both the normal and the 1/50 normal solution *increase* in strength materially on standing, the latter in particular. One normal solution having originally a factor of 1.0235, now (after two years) has a factor of 1.0600, and others have shown about the same increase. In the case of N/50 potassium hydroxide solution, the increase is more marked and rapid. One explanation offered was that the alkalinity of the glass container in the case of the N/50 solution a 500 Cc. volumetric flask is responsible for the increase in strength.—*Journ. A. Ph. A.*, March, 1913, 301.

#### MAGMA.

**Magma Magnesiae.**—*Improved Formula.*—George M. Beringer recommends the following improved formula for the manufacture of this preparation:

Magnesium sulphate.....	250	Gm.
Sodium hydroxide.....	100	Gm.
Water.....	a sufficient quantity	

Dissolve the sodium hydroxide in one thousand cubic centimeters of water and the magnesium sulphate in another portion of one thousand cubic centimeters of water and filter the solutions. Heat the solutions to boiling and add the magnesium sulphate solution to the solution of hydroxide of sodium, with constant stirring. Boil the mixture for fifteen minutes, then remove from the fire and wash several times by decantation, and then on a close muslin strainer until the washings are free from saline taste and give not more than a slight turbidity with barium chloride T. S. Allow the magma to drain, then transfer to a suitable vessel and add sufficient water to make 1000 Cc. and mix thoroughly. Satisfactory water for use in this process can be cheaply and readily obtained by adding 5 grams of powdered magnesium carbonate to each liter, boiling and then filtering. *Proc. N. J. Phar. Assn.*, 1913, 46-48. (E. C. M.)

#### MASSA.

**Massa Ferri Carbonatis.**—*Suggestions for a Revised Formula.*—Mr. Raubenheimer having submitted to sub-committee No. 13 (U. S. P. Revision) some changes in the official formula for preparing Vallet's mass, L. E. Sayre has subjected the suggestions made to critical review and experiment. The changes proposed concern both the ingredients and the manipulation and are as follows: (1) Increase sugar from 25 to 35 Gm. and decrease honey from 38 to 25 Gm. (2) Use lactose in place of sugar and honey (adding 30 Gm. lactose to drained magma). (3) Add also 5 Gm. magnesium oxide.

The lactose is recommended as a substitute for sucrose to overcome the softness of the mass, being less soluble than sucrose, thereby acting as an absorbent and producing a better pilular mass. The mass, however, becomes dry and hard in a dry climate, but this can be remedied by the addition of a proper amount of glycerin. The addition of the small amount of magnesium oxide before evaporation prevents oxidation and has a very decided advantage by imparting a greenish color to the mass. Professor Sayre suggests that with these modifications and the observance of Mr. Raubenheimer's method of manipulation (which is described in detail), experiments be made by pharmacists interested and the results communicated to him or other members of sub-committee No. 13. *Journ. A. Ph. A.*, May, 1913, 583-585.

#### MISTURA.

**Mixtures of the United States Pharmacopœia.** Oliver T.

Osborne seriously questions the advisability of including in the Pharmacopœia of the United States a number of the now official complex mixtures because many of the ingredients are needless and useless. In fact it is generally recognized that these complex mixtures themselves are unscientific.—J. Am. M. Assoc., 1913, 61, 1289-1293. (M. I. W.)

## OLEA.

**Aromatic Castor Oil.**—*Formula.*—P. Henry Utech, Ph.G., contributes the following formula:

Benzosulphinide.....	0.5 Gm.
Oil anise.....	2 Cc.
Oil sweet orange.....	1 Cc.
Oil color, q. s.....	
Castor oil, q. s., ad.....	1000 Cc.

Dissolve the benzosulphinide in the oil by the aid of a gentle heat. When cold add the essential oils and oil color sufficient to make the desired shade. The oil color is made by exhausting Alkanet root with acetone, and evaporating the resulting liquid to dryness at a heat not exceeding 55° C.—Proc. Penn. Phar. Assn., 1913, 307-308. (E. C. M.)

**Grey Oil.**—*Preparation from Calomel.*—M. Sauton recommends the preparation of a "grey oil" from calomel by taking advantage of its reduction by mercuric sulphocyanide. Calomel, 23.55 Gm., and mercuric sulphocyanide, 8.10 Gm., are triturated with some lanolin, and then sufficient vaselin oil to produce 100 Cc. of the mixture. So obtained, the "grey oil" contains 0.01 Gm. metallic mercury and 0.01 Gm. mercuric sulphocyanide in each cubic centimeter. Unfortunately the mixture possesses no stability, decomposition setting in after a few weeks with change in color.—Pharm. Ztg., lviii (1913), No. 82, 820; from Journ. de Pharm. d' Anvers, 1913, No. 17.

**Oleum Cinerium.** *Exhibition of Doses in Ampuls.*—To improve and facilitate the subcutaneous administration of *Oleum cinerium*, Th. Bengelsdorff recommends the enclosure of the medicament in ampuls containing the required dose. The oil is prepared by the formula of Zieler, which is as follows:

Hydrarg. puriss. bidestillat.....	40.0
Lanolin. puriss. sterilis.....	15.0
"Oleum dericini" sterilis.....	45.0

The mercury is first carefully triturated with the lanolin, the "*Oleum dericini*" is then gradually added, and the trituration



continued until the metallic globules are completely extinguished, the "*Oleum dericini*" being lighter than liquid paraffin and therefore superior for this operation.

To fill the ampuls, which must be previously well washed and sterilized, they are first partly filled with ether, and the ether again vaporized by heat, whereby they retain an extremely attenuated ethereal gas. Each ampul is heated by itself, and its open point is then introduced into the oil, which must be constantly stirred until upon cooling the grey oil enters and fills the ampul by suction due to the condensation of the gaseous ether. The point of the ampul is now withdrawn, carefully wiped, heated slightly to cause the downflow of oil adhering to the interior of the neck, and then sealed. In use the ampul with contents is slightly warmed by immersion in warm water and well shaken before breaking off the point. The slight heating to which the filled ampul is subjected does not cause the coalescence of the mercury into globules, but cannot be repeated without danger of doing so. — Pharm. Ztg., lviii (1913), No. 19, 191.

**Iodoferrated Cod Liver Oil.** *Valuation.* Moellering describes a simple method for the detection of iron and iodine in iodoferrated cod liver oil which gives also approximately correct quantitative results. Applied to an examination of a popular cod liver oil specially exploited under the name *Iodella*, which is claimed to contain 0.2 per cent. of ferrous iodide, this was proven by this method to contain only minute traces of iodine and iron. Pharm. Ztg., lviii (1913), No. 79, 790.

**Cod Liver Oil.** — *Inefficiency of Fat-Free Preparations.* Dr. P. E. Hommel condemns the use of such preparations and says that clinical experience has convinced him that they do not represent the remedial value of the oil and that whatever efficacy they apparently possess is due more to the various remedial agents associated with them in their manufacture. Proc. N. J. Phar. Assn., 87-89. (E. C. M.)

#### OLEORESINÆ.

**Extract of Male Fern.** — *Basis and Method for Standardization.*

Introducing a comprehensive study of the voluminous literature on the subject of *Extractum Filicis*, Dr. P. Bohrisch observes that notwithstanding numberless propositions to secure a product of approximately uniform activity, complaints continue to appear from physicians as well as in the professional press that such uniformity has not yet been attained. After reviewing the re-

puted active constituents of this extract, among which filicic acid and "crude filicin" have been variously regarded as the most important, the author considers in much detail the different methods that have been proposed for the standardization of this preparation. Among these, he regards the method of Fromme, as modified in the *Phar. Helvetia*, depending on the estimation of the "crude filicin," as being the most serviceable for standardization, since pure (crystalline) filicic acid has been proven to possess no anthelmintic value, whereas the "crude filicin" is doubtless associated with the body or bodies that possess the real anthelmintic activity of the drug.

The chief defect in the extracts of male fern resides in the variability of content of the active constituents, which is exemplified by the quantity of "crude filicin" obtainable from different samples. Serviceable methods for the estimation of the "crude filicin" have been prepared by Böhm and by Fromme, that of the latter, excelling in simplicity and convenience, having been adopted almost unchanged in the *Phar. Helv.* In brevity, this consists in dissolving 5.0 Gm. of the extract in 30.0 Gm. ether, adding 100.0 Gm. of 3% solution of barium hydroxide, shaking vigorously in a separator, drawing off 86.0 Gm. (= 4.0 Gm. extract) of the aqueous layer, adding to this 3.0 Gm. of 25% hydrochloric acid, and shaking this out with 25-15-10 Cc. of ether. The united ether solution is evaporated (or distilled) to dryness, the residue dried to constant weight and, after standing half an hour in an exsiccator, weighed. The so-ascertained weight, multiplied by 25, gives the percentage of "crude filicin" in the sample. In this way the author ascertained the following percentages of "crude filicin" in samples of *Extractum Filicis* (in bulk and in capsules) obtained from reputable manufacturers:

Article Source	<i>Extractum Filicis</i> in Bulk.					<i>Extractum Filicis</i> in Capsules.				
	Own make	A	B	C	D	A	B	C	D	E
Sp. gr. ....	.....	0.9888	0.9842	0.9836	1.0109	0.9824	...	1.0135	1.0255	0.9910
Crude filicin										
".....	18.22	14.85	15.12	16.00	24.00	15.02	23.42	26.77	27.72	14.45

The possible causes for these variations are briefly reviewed by the author, who mentions that the "crude filicin" necessarily also varies in the amount of active constituents, as represented in the so called resin or acid-like constituents associated with it. Nevertheless, it is believed that the percentage of "crude filicin" affords an excellent criterion of the activity of the extract, the im-

portant question being what percentage should be demanded. The requirement of 26-28 per cent. by the *Phar. Helv.* is regarded too high and is rarely attainable; it should probably not exceed 24-26 per cent. It has therefore been proposed to isolate the crude filicin from the extract and to dilute this to the adopted standard. The question of a suitable diluent, however, is still in controversy, the one best adapted being probably *Oleum Ricini*, which by some manufacturers is now used for this purpose.—*Pharm. Ztg.*, lviii (1913), No. 61, 601-603.

**Extract of Male Fern.**—*Analytical Notes.*—Referring to the observation of E. J. Parry, derived from analytical data (see Proceedings, 1911, 83) for pure and adulterated extract of male fern, to the effect that castor oil affected its physical characters, C. A. Hill, in a paper read before the British Pharmaceutical Conference, mentions that he had occasion to examine a considerable number of male fern extracts, in the case of certain adulterated samples to separate and identify the adulterant, to try different analytical methods, and to compare the analytical data obtained from genuine extracts of foreign importation with those afforded by extracts prepared under his supervision. His results go to show that an assay process for the determination of filicic acid is of first importance; and that this, taken in conjunction with physical and chemical constants for the genuine product, forms the best safeguard against adulteration. The analytical data are exhibited in a table (reproduced below), and from a consideration of the results he draws the following conclusions:

**Specific Gravity at 15°.**—This is usually higher than that of sample 1 in the table. In extracts having a low sp. gr. the smell of ether is sometimes apparent. The addition of chlorophyll to improve the color of the extract lowers the sp. gr.

**Refractive Index at 40°.**—This should not be below 1.49; in fact, it might be advisable to fix the limit slightly higher.

**Loss on Drying at 100° C.**—Commercial extracts always contain water, and occasionally traces of ether and alcohol also. The loss should not exceed 6 per cent., while 5 per cent. might perhaps be considered a sufficiently high limit.

**Petroleum-Ether Test.**—The proportion, by volume, of extract remaining undissolved when the extract is mixed with ten times its volume of petroleum ether should not exceed 20 per cent. after centrifuging.

**Crude Filicic Acid (Filicin).** As determined by the process of the Phar. Helv., genuine extracts appear to yield anywhere from 19 to 26 per cent. of crude filicic acid. They occasionally go higher, and he has met such samples. The requirement of the Phar. Helv., 26 per cent. to 28 per cent. appears, to be too high; 22 per cent., he thinks, would be a fair *average* value for a genuine extract, and 20 per cent. a fair *minimum* requirement, although unadulterated products may occasionally yield slightly less.

**Potash Insoluble.** The portion insoluble in 1 per cent. aqueous potash (obtained as explained below) is for genuine extracts fairly constant in the neighborhood of 50 per cent.

#### TABULATED RESULTS.

Sample.	Specific Gravity.	Refractive Index.	Petro-		Crude Filicic Acid.	Potash Extract.	Potash Insoluble.
			Loss on Drying at 100° C.	leum-Ether Test.			
1	0.998	1.4869	....	74	13.2	.....	.....
2	1.0036	1.4940	....	35	19.3	.....	.....
3	1.0075	.....	....	15	23.75	.....	.....
4	1.0065	.....	....	16	22.65	.....	.....
5	0.9944	1.4925	5.22	3.2	20.22	.....	.....
6	1.0045	1.4935	3.63	4.3	23.1	.....	.....
7	1.0109	1.4965	2.44	....	24.55	.....	.....
8	0.9985	1.4960	4.64	2	24.5	48.5	46.86
9	1.024	1.5025	....	8	29.75	.....	.....
10	1.0233	1.4922	6.6	9	25.15	42.5	50.9
11	0.998	1.4915	4.4	11.5	21.6	37.9	57.7
12	1.009	1.4965	3.65	7.5	22.0	42.95	53.4
13	0.9829	1.4823	5.03	60	11.6	21.43	73.54
				about			
14	1.0235	1.5006	2.69	7	25.27	39.5	57.81
15	1.0006	1.4874	2.57	65	14.1	27.13	70.3
16	1.019	1.4988	4.57	5	27.1	39.9	55.53
17	0.9850	1.4920	2.43	6	18.92	33.8	63.77
18	1.0179	1.4980	6.52	5	23.72	43.36	50.12
19	1.0000	1.4909	6.68	10.5	21.57	36.4	56.92
20	1.0219	1.5036	3.55	7.5	27.82	38.9	57.55
21	1.000	1.4945	4.23	1.5	20.67	37.62	58.15
22	1.0227	1.4990	6.5	10	28.1	46.24	47.26
23	0.9921	1.4880	4.84	12	18.1	31.53	63.63

The "Potash Insoluble" is obtained by dissolving about 20 Gm. of the extract in ether and shaking the solution repeatedly with 1 per cent. potash solution until nothing further is extracted. The alkaline liquors are washed with ether, which is then added to the original ether solution, and this evaporated, dried, and



weighed = "Potash Insoluble," while the alkaline solution, after acidification with hydrochloric acid, is extracted with ether, which yields the "Potash Extract" on evaporation to dryness.

The "Potash Insoluble" portion will contain practically all of any fixed oil added as adulterant, and it becomes, therefore, of interest to examine this portion. Trans. Brit. Pharm. Conf. (Year-book of Pharmacy), 1913, 489-493.

**Extract of Male Fern.** *Analytical Constant.*—This paper on the analytical constants of extract of male fern, contributed to the British Pharmaceutical Conference, 1913, by E. F. Harrison and P. A. W. Self, is, like the preceding paper, prompted by the limiting figures for certain analytical constants for the genuine extract as laid down in Mr. Parry's article on the adulteration of extract of male fern (see Proceedings, 1911, 83). Mr. Parry having failed to mention or describe the authentic source of the material and preparations upon which his constants were based, the authors considered it desirable to add to the available data for genuine extracts the results obtained with material of known and unquestioned source. This material consisted of eleven specimens supplied from a reliable firm, which were labeled as follows:

No. 1. "Harz." Rhizome and bases of petioles; dark, but otherwise fair average specimen.

No. 2. "Schwarzwald, Württemberg." Normal.

No. 3. "Bayern." Large rhizome with bases of petioles.

No. 4. "Mosel. Rhein-Preussen." Normal.

No. 5. "Bayern." Large rhizome with petiole bases.

No. 6. "Harz." Small rhizome with petiole bases; dark.

No. 7. "Harz." Normal.

No. 8. "Harz." Rhiz. filicis crud. depurat. "für feine Extracte." Petiole bases freed from rhizome, scales, and rootlets.

No. 9. "Harz." Rhizoma filicis mundat. "für allerfeinste Extracte." Petiole bases freed from rhizome and peeled, together with pieces of rhizome also peeled and cut up longitudinally; no scales or rootlets. In making the extract the bases of petioles and the rhizome were used in the proportions in which they were present in the whole specimen.

No. 10. "Bayern." Large rhizome with petiole bases.

No. 11. "Stockholm." Rather dark, otherwise normal.

The three samples of Bavarian rhizome, Nos. 3, 5, and 10, were too large to be covered by the description in the British Pharmacopœia, some pieces being 12 in. long. The yield of extract and the analytical results are given in the following table:

Sample.	Yield of Extract, Per cent.	Sp. Gr.	Ref. Index at 20°.	Insoluble in 10 vols. of			
				Saponi- fication Value.	Unsaponi- fiable, Per cent.	Petroleum Ether, Per cent.	Crude Filicin, Per cent.
1	9.5	1.037	1.5120	251.5	6.5	5.6	27.7
2	7.5	1.037	1.5145	227.0	6.7	3.2	26.5
3	7.7	1.041	1.5122	248.0	6.7	13.0	24.2
4	7.0	1.039	1.5088	254.5	6.6	7.9	24.1
5	9.7	1.052	1.5157	236.5	5.9	14.8	28.0
6	11.6	1.033	1.5088	255.0	5.1	7.7	24.5
7	8.8	1.029	1.4995	259.0	4.3	10.6	19.3
8	7.9	1.023	1.5018	225.0	4.9	9.2	21.9
9	8.3	1.018	1.5036	247.0	4.1	3.8	21.5
10	8.6	1.035	1.5126	259.0	5.0	4.6	24.7
11	10.9	1.037	1.5102	252.5	4.9	4.2	19.7

The crude filicin was determined with baryta by the Swiss Pharmacopœia method. The two samples of drug which gave extreme figures for extract differed little in appearance, but came from different districts (Rhenish Prussia and the Harz Mountains, respectively). Extract No. 8, made from bases of petiole alone, gave figures within the extremes for other samples except saponification value, which was slightly lower than No. 2. Leaving No. 8 out, because it was not made from official drug, the extreme values for the several constants are as follows, Parry's limits being given alongside for comparison:

Harrison and Self.	Parry.
Sp. gr., 1.018 to 1.052	Not below 1.000; usually 1.004 to 1.025.
Ref. ind., 1.4995 to 1.5157.	Not below 1.500; usually 1.505 to 1.509.
Sap. value, 227 to 259.	230 to 250.
Unsaponifiable, 4.1 to 6.7 per cent.	8 to 11 per cent.
Insol. in petroleum ether, 3.2 to 14.8 per cent.	Nothing but a little flocculent matter.
Crude filicin, 19.3 to 28 per cent.	Not below 20; usually 22 to 28 per cent.

Parry's limits would exclude all the above genuine samples, and most of them in regard to two or more characters.—*Trans. Brit. Pharm. Conf. (Yearbook of Pharmacy), 1913, 494-497.*

#### PASTA.

**Chalk Paste: A Substitute for Bismuth Paste.**—Inasmuch as bismuth paste has produced toxic effects in numerous cases, Mitchell recommends a chalk paste composed of equal parts of chalk and petrolatum. This paste is said to be even more effective than the bismuth paste and also permits the use of the Roentgen rays. Very likely its calcium content stimulates the formation

of white blood corpuscles. *Zentralbl. F. D. ges. Therap.*, July, 1912. (O. R.)

**Caustic Pastes.** *Use of Sulphuric Acid.* W. A. Pusey says that a sulphuric acid paste may be effectively used for destroying lesions in the skin. It is not a desirable agent, however, for the removal of blemishes or when one needs to consider cosmetic results, for the reason that the extent of its action is not easily estimated and all mineral acids, particularly sulphuric acid, are not infrequently followed by keloids or unsightly hypertrophic scars. *J. Am. M. Assoc.*, v. 60, 434-435. (M. I. W.)

#### PILLULAE.

**Pill Excipients.**—*Review of Their Pharmacological Suitability.*—Th. Douglass has made a pharmacological study of the suitability of different excipients in use for making pill masses and reports the following results: In the case of perfectly fresh pills, with probably the single exception of wax, all the constituents of the pill excipients usually employed for massing are serviceable; that is to say, they readily cause the disintegration of the pills and quickly permit the medicament to exert its activity. As such constituents of the excipient he mentions: *Bolus alba* with glycerin; *radix althææ* with gum arabic; *saccharum album* with *paraffinum liquidum* and *cera flava*; *radix althææ* with *extractum gentianæ*; (*succus liquiritiæ depur.*) and *radix liquiritiæ*. In the case of pills three months old, which are not completely protected against drying, there exists a great difference in their disintegration, depending on the original presence of glycerin or of water—the glycerin preventing the drying of the mass. Further experiments, regarding the digestibility of the pills and the separation of the medicaments, determined that the individual differences in pharmacological effect are dependent more on the period required for absorption than upon the time necessary for disintegration.—*Pharm. Ztg.*, lviii (1913), No. 56, 551; from the Inaugural-Dissert. of the Author, Rostock, 1913.

**Pill Excipients.** *Advantage and Limitation of Glycerin.* Referring to the general recommendation by the author of the preceding paper of glycerin as an excipient for pill masses, Dr. K. Dieterich mentions that even glycerin has its limitations; for, while he has himself recommended the use of glycerin for this purpose, its addition must be circumspect in their manufacture because the pills are liable to lose their shape on keeping. Moreover, pills containing glycerin cannot be sugar-coated, nor satis-

factorily silver coated. —Pharm. Ztg., lviii (1913), No. 56, 551; from Südd. Ap. Ztg., 1913, No. 51.

**Blaud's Pills.** — *Professor Lenhartz's Formula.*—The apothecary of the "Allgemeinen Krankenhaus," Eppendorf, communicates the following authentic formula and process of Professor Lenhartz for Blaud's pills:

Ferrum sulfuric, cryst. D. A.-B. 5.....	120.0 Gm.
Sacchar. alb. pulv.....	40.0 Gm.
Glycerin.....	42.0 Gm.
Kal. carbonic. pulv.....	60.0 Gm.
Natr. bicarbonic.....	60.0 Gm.
To make.....	1000 pills

The ferrous salt, sugar and glycerin are triturated, in the order named, to form a perfectly homogeneous mass: then the potassium carbonate is added, followed by the sodium bicarbonate. The thoroughly triturated mixture is then transferred to a steam bath, and 75.0 Gm. of distilled water having been incorporated, it is allowed to stand on the steam bath two or three days, whereupon a mixture of

Magnes. usta.....	10.0 Gm.
Rad. althææ pulv.....	20.0 Gm.

is added, and the whole evaporated to 300.0 Gm. The mass is then thoroughly worked in an iron mortar, or better, in a kneading mill, adding if needed a little "glycerin ointment," and finally divided into 1000 pills, each weighing about 0.3 Gm. —Pharm. Ztg., lviii (1913), No. 3, 25.

**Pills of Silver Nitrate.** — *Use of Purified Bole.*—H. Franck claims that Bolus of the German Pharmacopœia is not suitable for the preparation of pills of silver nitrate, as it is generally an impure article. He recommends the use of a purified bole, which should be free from iron, calcium and magnesium.—Apoth. Ztg., 1913, No. 26, 232–233. (O. R.)

#### PULVERES.

**Saccharated Ferrous Carbonate.** — *Preservative Action of Sugar.*

In a short note, L. Vanino states his impression that the preservative action of sugar on ferrous carbonate can be ascribed to the fact that sugar acts as a catalyzer, its presence preventing oxidation even as does the presence of sulphites and of tin chloride. This seems shown by the fact that the chemicals just mentioned preserve ferrous carbonate almost as well as does sugar.—Arch. d. Pharm., 251 (1913), No. 4, 294. (H. V. A.)



**Saccharated Ferrous Carbonate.** *The Sugar Act as a Catalyst.*

P. W. Danckwortt discusses the article on the subject by L. Vanino and states that the quotation from the "Kommentar zum Arzneibuch" found in the article was taken from an old—not from the latest—edition of that work. Danckwortt then gives a brief résumé of the action of cane sugar in preserving the ferrous carbonate. *Arch. d. Pharm.*, 251 (1913), No. 5, 350. (H. V. A.)

## SAPONES.

**Sapo U. S. P.**—*Is "Castile Soap" a Proper Synonym.*—Azor Thurston observes that this appears to be a very simple question to answer, but finds on investigation there are very conflicting statements in reference to this subject. He has, however, made a comprehensive study of the question, quoting authorities pro and con, and after weighing all the evidence concludes that it is perfectly proper to apply the term "castile" as a qualifying synonym for Sapo U. S. P., and that a ruling to this effect is desirable. — *Journ. A. Ph. A.*, July, 1913, 854–857.

**Castile Soap.**—*Improved Methods of Analysis.*—Joseph L. Mayer observes that so many soaps sold as "castile" are not what they are labeled, that it is necessary to subject samples to analysis in order to determine whether they are properly made olive oil soaps. To carry out the work properly a representative sample should be taken from different parts of a bar, such as the outer and inner surfaces, and after being thoroughly mixed kept in a tightly corked bottle from which samples are taken as required for the analysis. The water determination must be conducted with care as directed in the U. S. P., observing particularly to avoid overheating. The pharmacopœial test for animal fats is not very satisfactory because the Pharmacopœia allows 3.6% of water, a quantity quite excessive and not contained in many samples. Hence the 4% alcoholic solution of the sample expected under the conditions of the test, when allowed to cool to room temperature (not below 20° C.), may in reality contain much more soap—depending on the amount of moisture—and thus indicate animal fat by gelatinizing, although not containing any. The Pharmacopœia should therefore provide tests for ascertaining the origin of the fat by determining the iodine number of the fatty acids and their melting points. The author discusses the methods for the separation of the fatty acids, the determination of their iodine numbers and melting points; the tests for silica and other insoluble matter; of sodium carbonate, and of free alkali—

the latter test being quite inexact and indefinite. He finds, furthermore, that the determination of the refractive index of the fatty acids often gives valuable information with reference to the origin of the fat employed in making the soap.—*Journ. A. Ph. A.*, June, 1913, 734-736.

**Soaps.** *Effect upon the Skin.* Frederik Gardinger, owing to his researches, arrives at the following conclusion: All soaps, owing to their chemical composition, irritate the skin. This irritation is greatest in soaps prepared with cottonseed oil, paraffin derivatives and rancid fats. Soaps do not possess any bactericidal action. The addition of phenol and other antiseptics is entirely useless and frequently harmful. The manufacture of so-called super-fatted soaps is without any scientific foundation, as upon washing the free alkali combines with the excess of fats. *Münch. Med. Wschr.*, 1912, 2697. (O. R.)

**Liquid Shampoo or Toilet Soap.**—*Practical Formulas.*—In response to the many inquiries that have appeared in the current issues of the various drug journals for a liquid soap that a pharmacist could prepare and dispense under his own label, Ernest R. Jones, in a paper presented at the Denver meeting of the Association, discusses such a preparation and gives working formulas that are in his experience best adapted to the prevailing water supply—soft, medium hard, or hard water—in the localities in which the preparation is being exploited. He says that practically all the oils or fats are adaptable to making liquid soaps excepting perhaps castor oil, which in his experience produces a soap having very poor lathering qualities. Nor is any single oil or fat adaptable in any case, a combination of cocoanut oil, cottonseed-oil and stearic acid, in varying proportions depending on the character of the water supply, being most suitable. The formulas which he would suggest are exhibited in the following:

Formula for 2500 Cc.	Medium		
	Soft Water.	Hard Water.	Hard Water.
Cocoanut oil .....	100 Gm.	200 Gm.	300 Gm.
Cottonseed oil .....	400 Gm.	300 Gm.	200 Gm.
Commercial stearic acid .....	100 Gm.	100 Gm.	100 Gm.
Caustic potash, U. S. P., 85% .....	120 Gm.	126 Gm.	132 Gm.
Caustic soda, U. S. P., 90% .....	12 Gm.	12 Gm.	12 Gm.
Alcohol .....	125 Cc.	125 Cc.	125 Cc.
Potassium carbonate .....	20 Gm.	30 Gm.	40 Gm.
Soft or distilled water .....	q. s.	q. s.	q. s.
Talc .....	15 Gm.	15 Gm.	15 Gm.

Melt the stearic acid and oils together and add the caustic potash and soda dissolved in 1000 Cc. soft water. Boil carefully, to avoid burning, adding more water as necessary, until no alkali is perceptible upon tasting. Then add the potassium carbonate dissolved in 250 Cc. soft water and boil for two hours more. Allow to cool, add the alcohol and perfume if desired, and add sufficient soft water to make 2500 Cc. Let stand three days, or longer if possible, add tale and filter through double filter paper until clear.

For cheap odors, oils of rose-geranium, sassafras, lavender, bergamot, caraway or citronella are good; a formula for a pleasing combination imparting a delicate lilac-like odor is also given. If coloring is desired, *yellow* is obtained by the use of 1 grain of Lieber's Deep Yellow No. 3003 to 2500 Cc. of the liquid soap; or, if *green* is wanted, 1 grain of Lieber's Vertoline Green No. 1855 will impart it. *Pine Tar Shampoo* is obtained by dissolving 10 Gm. of pine tar in the alcohol, and removing the insoluble portion from the shampoo by filtration.

Excellent products are thus obtained, which produce an abundance of lather in all kinds of water, and when used as a shampoo, leave the hair light and fluffy. They contain no free caustic alkali, as an excess of fat over the amount of caustic alkali is used, and potassium carbonate is used to complete the saponification of the balance of the fat.—Journ. A. Ph. A., December, 1914, 1537-1540.

#### SPIRITUS.

**Spirit of Camphor.**—*Simple Method of Valuation.*—J. Jumeau recommends the following simple method for the valuation of spirit of camphor: To 10.0 Gm. of spirit of camphor about 4 times the quantity of *Liquor plumbi subacetatis* is added and the mixture well shaken. The camphor is thus precipitated and collects on the surface. It is removed and washed by filtration, dissolved on the filter in ether, the solution collected in a tared glass dish, and the ether evaporated. The last traces of water are removed from the camphor in the exsiccator, and the camphor then weighed.—Pharm. Ztg., lviii (1913), No. 90, 901; from Bull. des Science Pharmacol., 1913, No. 10.

**Spirit of Nitrous Ether.**—*Reasonable Stability when Properly Prepared and Kept.* F. L. Shannon, State Analyst, Lansing, Mich., records experiments undertaken to determine the keeping qualities of spirit of nitrous ether. A quantity of the spirit, properly prepared and responding to the requirements of the U. S. P. VIII, was divided into seven bottles of various sizes and colors (amber,

flint and green), securely stoppered with ordinary cork stoppers, and stored in a semi-dark place adjoining the laboratory, the temperature of which is about 65° to 75° F., and so kept for a period of fifteen months, assays being made of all the samples on the same day at intervals of three months. The results given in a table showed an average loss of only 0.37% during the first six months. The greatest loss during the entire time seems to be in the samples stored in the flint glass bottles, the remainder keeping fairly well for the first nine months. During the latter part of the experiment, however, the samples in the flint glass bottles decreased considerably, while those in the amber and green-colored bottles decreased in strength only a small amount in the whole fifteen months and the decrease was quite regular, the maximum being but 0.54% with an average of 0.44%. It would therefore appear that spirit of nitrous ether, when manufactured properly so that it will contain 4% ethyl nitrite when freshly prepared and stored in small dark-colored bottles in a cool place, will remain of standard strength for a long period of time. If, then, the pharmacist will make this preparation in quantities that will be consumed within a period of six months, he should have no fear that he is not dispensing a U. S. P. spirit all the time. — *Journ. A. Ph. A.*, January, 1913, 83-85.

**Sweet Spirit of Nitre.** — *Transient Red Color Produced by Alcohol.*

— In making sweet spirit of nitre from the concentrated ether, Wm. S. White found that with some samples of alcohol a very red color would immediately appear, but after standing about 12 hours they would resume their natural color. He attributes this to a small amount of tannin in the alcohol, which is sometimes dissolved from the barrel. — *Journ. A. Ph. A.*, August, 1913, 939.

**Spirit of Peppermint.** — *Estimation of Volatile Oil.* — The estimation of oil of peppermint in spirit of peppermint has heretofore usually been carried out by Charles H. LaWall and Leroy Forman by means of the precipitation method as used for spirit of lemon, using a Babcock milk flask with a graduated neck, for which, in the form adopted in the U. S. Dept. of Agriculture Bulletin No. 107, the method is entirely satisfactory. In the case of spirit of peppermint, however, varying results were obtained, which, on investigation, were found not to lie with the principle of the method, but with the manner in which it is carried out. The use of a Babcock milk flask, holding as it does only a little more than 25 Cc. of liquid, does not permit of sufficient dilution with water in preparations containing a high amount of alcohol and a low



amount of oil, for peppermint oil is distinctly more soluble in diluted alcohol menstrua than is lemon oil. Experiments have shown that where the alcoholic strength is reduced below 25 per cent., the amount of oil dissolved is negligible, but the use of so small a proportion of the spirit in a Babcock milk bottle makes the separated volume of oil so small in amount as to seriously interfere with the sensitiveness of the method to within one or two per cent. A larger flask was therefore designed by the authors which gives very good results and which consists of a conical flask of 100 Cc. capacity terminating in a long, narrow tubular neck not over 12.5 Mm. in diameter and graduated up to 10 Cc. in one-tenth. With such a flask, gravitation alone suffices to bring the oil up into the neck of the flask within several hours, occasionally rotating to lessen the tendency of the globules to adhere along the sides of the flask and neck. If the flask were constructed, as could easily be done, so as to permit of whirling in a centrifuge, the estimation could be made accurately and satisfactorily within a very few minutes. Such flasks are now used by the authors for the determination of all the spirits of volatile oils lighter than water.—Journ. A. Ph. A., December, 1914, 1504-1505.

#### SUCCI.

**Cherry Juice.**—*Modification of G. P. Manipulation.*—According to the G. P. V fresh, sour, black cherries are pulped in a mortar together with their seeds and the pulped mass is then allowed to stand loosely covered at the room temperature to undergo the prescribed fermentation, after which the juice is expressed and filtered through paper. Dr. Robert Frey, however, cautions against the complete pulping of the seeds, and on the basis of his experiments and experience recommends that the seeds should be only superficially broken, so that the kernels are not ruptured. The resulting juice after fermentation will be found to have the full flavor, quite as pronounced as when the seeds are completely pulped, is filtered readily and keeps well; whereas, when the official directions are literally followed, the juice filters very slowly and with difficulty, suffering in flavor and also in subsequent stability. The author also makes some practical observations regarding raspberry juice (*Rubus idaei*), black currant juice (*Ribes nigrum*), and red currant juice (*Ribes rubrum*), chiefly in reference to the value of amyl alcohol for the detection of foreign coloring matters.—Pharm. Ztg., lviii (1913), No. 87, 873.

**Raspberry Juice.**—*Valuation of Quality.*—Dr. Hepner has kept

an annual record of the characters and quality of the raspberry juices and syrups prepared from them and speaks authoritatively regarding the natural variations of the juice in different years, these variations depending on temperature and humidity as well as climatic conditions in general, locality, and soil. Thus the crop of fruit of the year 1912 shows marked differences from that of 1911, due to the abnormally rainy and cold weather, which manifests itself particularly in the low mineral content of the juice and of the alkalinity of the ash, which as in the past must be regarded as affording the most important criterions of valuation. The author's tabulated record of numerous analyses shows, however, that on the basis of the analytical data obtained, these variations are subject to fluctuations within certain definable limits. In doubtful cases, the year of its production, the source and the climatic condition prevailing during the growth of the fruit must be taken into consideration; when these fail as criteria in doubtful cases the alkalinity number, which shows greater constancy than the ash number, must serve as the final criterium.—Pharm. Ztg., lviii (1913), No. 19, 190; from Ztschr. f. Unters. de Nahr. u. Genussm., xxv (1913), No. 4.

#### SUPPOSITORIA.

**Suppositories.** *Selection of Base.*—Speaking of the bases commonly employed for making suppositories, Bruno Solomon mentions that these are of three kinds: 1, cacao oil; 2, fat, hardened with wax; and 3, glycerin, hardened with gelatin, soap, etc. Of these the cacao oil is the one still in popular use, but the author considers that the glycerin-gelatin base is pronouncedly superior for this purpose, possessing among other advantages the ability of combining with water and aqueous solutions of many medicaments, although some medicaments such as formalin, permanganate, silver nitrate, etc. would be excluded. To obtain the best results, however, it is advisable to avoid strong or prolonged heating, and to stir the mixture slowly and carefully so as to avoid the formation of air bubbles. To avoid this the author recommends a stock-mass, which he calls

“Mother-Mass,” and he prepares this as follows: 50.0 gelatin, 100.0 distilled water, and 100.0 glycerin (sp. gr. 1.26) are heated about 4 hours on the steam bath, stirring very sparingly and slowly. The scum that has formed, if any, is removed from the surface, and the mass is allowed to cool in a shallow vessel; it is then cut into small pieces and preserved for use. From this the

**"Mass"** is made by adding 150.0 glycerin (sp. gr. 1.26) to 100.0 of the previously melted mother mass. This mass, in general, is adapted for the exhibition of water soluble medicaments, dissolved either in water or in glycerin before addition. Insoluble substances, or substances easily decomposed, are best massed with cacao oil.

**"Agar-Agar Mass,"** obtained by enclosing 4.5 agar agar in a gauze bag, covering this with 50.0 distilled water, evaporating to 30.0, and, while hot, mixing the solution with sufficient glycerin to make 100.0, is recommended by the author for preparing *melting suppositories*.

**"Glycerin-Soap Mass"** is not to be recommended, the suppositories soon deteriorating, becoming soft.

**"Glycerin-Cacao Oil Mass,"** which according to the "Codex" is composed of 10.0 glycerin and 20.0 cacao oil, is better made by increasing the cacao oil to 30.0.

Finally, the author suggests the oval form for vaginal gelatin suppositories as being preferable to the ordinary shape. Pharm. Ztg., lviii (1913), No. 51, 502.

**Urethral Suppositories.**—*Method of Making.*—Henry C. Blair 3d, Ph.G., suggests a practical method of making urethral suppositories by the use of glass tubing about  $\frac{1}{16}$  inch diameter larger than the bougie required and gives direction for manipulation.—Proc. Penn. Phar. Assn., 1913, 362-3. (E. C. M.)

#### SYRUP.

**Syrupus Bromotannicus.** *Formula.* Dr. Thieren gives the following formula for syrup of bromo-tannini: Dissolve 2.0 Gm. of tannin in 25.0 Gm. of hot water, allow the solution to cool, add 2.0 Gm. of bromine dissolved in 100.0 Gm. of water, followed immediately by sufficient simple syrup to make 1000.0 Gm. The syrup is then aromatized with 2.5 Gm. tinctura aromatica, 4.5 Gm. tinctura vanillae, and 4 drops of acetic ether. Pharm. Ztg., lviii (1913), No. 19, 190; from L'Union Pharm., 1913.

**Syrup of Ferrous Iodide.**—*Preparation and Preservation.*—Dr. P. Bohrisch reaches the following conclusions as to preparation and keeping of this syrup. The disadvantages of the present method of preparation are that the reaction between iron and iodine is either too slow or too rapid. In the latter case a loss of iodine will invariably occur. He proposes to modify the present method

by the very slow addition of iodine and stirring with an iron spatula.

Syrup of ferrous iodide, when kept in bottles which are completely filled and which are exposed to the light, keeps well for at least one year. In order to make the syrup more permanent in the hands of the patient, who generally keeps medicines in a dark place, and who frequently exposes it to the air, Bohrisch recommends the addition of 0.05% of citric acid. He finds that the addition of glucose does not improve the keeping qualities of this syrup. The same holds true of the addition of sulphurous acid in the form of sodium bisulphite. --Pharm. Zhalle., 1913, Nos. 14 and 15. (O. R.)

**Syrup of Ferrous Iodide.** --*Preservation with Alcohol.* -- According to the observations of Dr. Noblet, syrup of ferrous iodide remains perfectly bright and unchanged if 1 per cent. of alcohol is added and the syrup is kept exposed to bright daylight. -- Pharm. Ztg., lviii (1913), No. 73, 729; from Bull. commerc., 1913, 329.

**Syr. Ferri Phos. Co., B. P. C.** --*Estimation of Iron and Calcium Phosphates.* -- Maurice S. Salamon and Wm. M. Seaber call attention to some difficulties experienced in the estimation of the iron and calcium in Compound Syrup of Iron Phosphate. Resorting at first to a method including both iron and calcium, it was finally decided to estimate them separately, as follows:

**Iron.** --Twenty Cc. of the syrup were diluted considerably, heated in a water bath, ammonia added in slight excess and, after standing in the water bath for some time, the precipitate was collected on a filter, washed quickly with boiling water, and ignited. The ignited precipitate was dissolved in hydrochloric acid, ammonia was added in slight excess, the precipitate filtered off, washed a little, dissolved from the filter in dilute sulphuric acid, reduced by boiling with copper foil, and titrated with permanganate. The iron was expressed as ferrous phosphate.

**Calcium.** --Twenty Cc. were taken, and a little hydrochloric acid and about 1 to 2 grams citric acid added. The whole was then made slightly alkaline with ammonia, and finally just acid with acetic acid. Ammonium oxalate was added in excess, and the calcium estimated as usual. It was proved by analyzing syrups of known calcium content that this process gave results almost theoretical. The following were the results upon seven commercial samples known to come from different sources:



	1	2	3	4	5	6	7	B. P. C.
Ferrous phosphate (gr.								
per drachm) . . . . .	0.33	0.27	0.15	0.38	0.39	0.26	0.13	0.50
Calcium phosphate (gr.								
per drachm) . . . . .	0.90	0.47	trace	0.56	0.47	0.56	0.20	0.80

In all the samples examined considerable inversion had taken place.

It will be seen that there is a considerable variation in the amounts of iron and calcium phosphates present in the different samples, though all are carefully labelled as being made from the formula of "Mr. Edward Parrish of Philadelphia." Chem. and Drugg., July 5, 1913, 2.

**Syrups of the Hypophosphites.** *Determination of Phosphorus Content.* The attention of H. E. Barnard and W. D. McAbee has recently been directed to the great difficulty of holding all the ingredients of Syrup of Hypophosphites, both simple and compound, in solution. The solution of the various salts in water is easily accomplished but the addition of the sugar precipitates a part and if the product is immediately strained, this precipitate is removed and the resulting solution is lower in strength than was originally intended. Upon inquiry, they found that several manufacturers had noted this fact and were somewhat in doubt as to the actual content of finished product, but had assumed the loss to be immaterial. In order to throw some further light upon this subject it became in the first place necessary to adopt or formulate a suitable method for the determination of the amount of hypophosphite in the product, a matter of seemingly great difficulty on account of the great amount of organic matter that must be destroyed in order to determine the actual amount of phosphorus present by the usual methods of conversion into phosphoric anhydride. The authors, however, finally successfully employed a modification of a method recommended by H. A. D. Jewett in the National Dispensatory. Briefly, this method consists in the liberation and oxidation of the hypophosphorous acid to phosphoric acid by means of bromine and the determination of the phosphoric anhydride in this condition. Any phosphites that might be present as impurities are removed by precipitation with lead acetate; but subsequent experiments showed that phosphites were present only in negligible quantities. For convenience, also, concentrated nitric acid was substituted for the bromine, the details of the method finally adopted being as follows:

Determine the specific gravity with a Westphal balance or pyknom-

eter. Weigh accurately two grams of the sample into a one hundred cubic centimeter beaker, add ten cubic centimeters concentrated nitric acid and cautiously bring to boiling. A violent reaction occurs at this point and care must be taken to prevent loss through bumping and boiling. When this violent reaction has ceased, add gradually forty cubic centimeters concentrated nitric acid and boil for five minutes. Nearly neutralize with ammonia, or, if not sufficient nitric acid remain to form the ammonium nitrate necessary for the molybdate precipitation, make alkaline with ammonia and again make acid with nitric acid. Ammonium molybdate is then added, the precipitate dissolved in ammonia and the phosphorus precipitated with magnesium in the usual way.

Having found a satisfactory method, samples were procured by the inspectors, who, to the surprise of the authors, reported that the two pharmacopœial preparations comprised but a small part of the hypophosphite syrups on the market—the majority found being made from special formulas. Consequently only twelve samples were subjected to examination, the results being given in a table, showing the expected amounts of hypophosphite, according to the U. S. P., and the amounts actually found. Of these, only two came up to the standard—the others were all woefully deficient, varying from 43% to as low as 10% of the required amount.—*Journ. A. Ph. A.*, December, 1914, 1505-1507.

**Compound Syrup of Hypophosphites.**—*Increase in Sugar and Improved Manipulation.* Samuel T. Hensel contends that the stability of compound syrup of hypophosphites is secured by increasing the quantity of sugar so that a saturated solution is produced when an excess of sugar is submitted to cold percolation with the aqueous solution of the saline constituents at the ordinary temperature. His method of procedure is as follows:

First: The solution of the iron and manganese hypophosphites and the sodium citrate is effected in a scrupulously clean porcelain capsule with the careful application of heat, filtered, and allowed to cool as directed in the U. S. P. VIII.

Second: The solution of calcium, potassium and sodium hypophosphites is made in the manner directed by the U. S. P. VIII.

Third: The alkaloids quinine and strychnine are dissolved in the diluted hypophosphorous acid as directed by the U. S. P. VIII.

The three solutions are then mixed, and this mixture is used as a menstruum for the percolation of the sugar. In regard to the latter, he has found Confectioners' Crystal A sugar the best both with

respect to purity and texture. The sugar is simply placed in a cylindrical percolator in the proportion of two parts by weight of sugar to one part by weight of solution, after having previously placed absorbent cotton moistened with distilled water in the neck of the percolator. Obviously, syrup made in the southern states will contain a trifle more sugar than syrup made in states in the north. In both cases, however, the product will contain no more sugar than is necessary for its complete preservation and stability. Furthermore, recent experience has convinced the author that heat, except in the preparation of the initial solution, should be rigidly avoided. — *Journ. A. Ph. A.*, January, 1913, 85-87.

**Syrupus Placendus.**—*A Modified Syrup of Raspberry.*—Prof. E. H. LaPierre, under the above name, recommends the following as a most agreeable vehicle:

Dried raspberries.....	30 Gm.
Citric acid .....	2 Gm.
Water, recently boiled and cooled.....	300 Cc.
Sugar.....	500 Gm.

Macerate the berries in the water in a cool place for 24 hours; place the sugar into a percolator, and add to this the mixture of macerated berries and water. The product will measure about 500 Cc. —*Proc. Mass. Phar. Assn.*, 1913, 133.

**Syrup of Raspberry.**—*Amyl Alcohol Test.*—W. Peyer and F. Hermann state that this test is apt to lead to wrong conclusions, as by the fermentation of raspberry juice together with raspberries, a red substance is formed which is soluble in amyl alcohol. If, however, the pressed juice is fermented *without the pulp*, then this substance will not be formed. *Zentralbl. f. Pharm.*, 1913, No. 18. (O. R.)

**Strawberry Syrup.** *Question of Preservatives.* Wiebelitz points out that strawberry syrup, in distinction from the syrups from other fruit juices, is usually prepared by cold methods and without previous fermentation of the juice, owing to the injurious effect of the latter, and of heat, on its flavor. In consequence, variable methods of preparation and conservation have been proposed and are in use, and he therefore raises the question to what extent and kind preservatives are admissible from the standpoint of pure food and drug inspection, which should be clearly defined. *Pharm. Ztg.*, lviii (1913), No. 68, 677.

**Syrup White Pine Comp.** *Improved Process of Preparation.*—Dr. Joseph Herb describes a process for the manufacture of this syrup with specific directions for packing the drugs and handling the percolate, which will be found useful to the individual maker of this popular cough remedy. He also gives practical tests for determining the purity of this syrup for use by those who purchase it. He suggests as an improvement to the formula the addition of ipecac in the proportion of one part of that drug to one hundred and fifty of the finished syrup. —Proc. Cal. Phar. Assn., 1913, 58-61. (E. C. M.)

#### TABLETTAE.

**Tablet Making for the Retailer.**—*Practical Details.*—In a voluminous paper, contributed by P. G. Chamberlain at the 1913 meeting of the British Pharmaceutical Conference, instruction is given in minute detail on the manufacture of tablets, with the particular object to encourage the retail pharmacist to prepare them himself in quantities and kind required by the demand of his business. The growing popularity of tablets among practitioners of medicine, and the advantages which tablets score over pills, are formulated by the following points:

- (1) Made by a scientific and hygienic method, ensuring more accurate dosage.
- (2) Enormous saving of time and labor.
- (3) Fairer to the apprentice, who can devote more time to studying other preparations.
- (4) Drudgery and obsolete methods eradicated from the dispensing counter.
- (5) Popular form of administering medicine with doctors and patients alike.

To be prepared at all times to carry out the operations of tablet making, in which simplicity, rapidity, and economy should be the watchwords of the operator, certain indispensable apparatus and appurtenances are required, a list of which is given by the author, who adds that no other agents whatever are used than those enumerated in this list.

The author classifies tablets in accordance with the methods required for their preparation, which he designates as: (1), a "general method," by adopting the usual formula for granulation, lubrication, and disintegration; (2) "direct compression" of the medicament; (3) "direct heat method," without granulation by the wet way. As by far the greatest number of tablets are made by

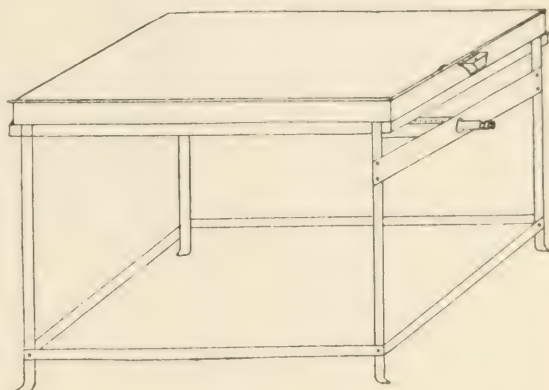
**The General Method,** the author gives a description of the various operations involved in detail, under the following headings:



A. Calculation of Formula. B. Weighing and Mixing. C. Granulation. D. Drying. E. Lubrication. F. Compression.

The chapter on "Drying" is illustrated by a cut (Fig. 53) showing a *Hot Table* of his invention for drying the granulated material, which by the use of other expedients had on more than one occasion met with disaster by overheating, and required constant attention. Its general usefulness invites the full description of this, which is here given *verbatim*, as follows:

FIG. 53.



Tablet Working Table.

"It is simply a long, shallow enclosed copper bath supported on iron legs; underneath it runs a long gas burner capable of fine adjustment. The tank is filled about half full with water and then heated; in about fifteen minutes the copper surface is quite hot. Now the various batches of granules that are to be dried are spread out on their respective sheets of paper and placed on this hot table. In order to save time it is advisable to wait until several lots of tablets want making, and then they can be granulated one after the other and all dried together, the hot plate being large enough (48 in. x 20 in.) for receiving several lots."

Attention is also given under separate captions to: "Causes of Trouble;" the methods of "Direct Compression" and of "Direct Heat," are also explained; the "Time Involved in Tablet Making" is mentioned, and "Examples of Formulae" are given. The details of all these operations must be consulted in the original. Trans. Brit. Pharm. Conf. (Yearbook of Pharmacy), 1913, 533-544.

**Medicinal Tablets.** — *Commercial Quality.* — George E. F'we calls attention to a sample of Boric Acid and Buchu Compound Tablets which, while being represented as having been made by a formula containing seven grains plus of ingredients, really averaged in weight but 5.95 grains.—Proc. Penn. Phar. Assn., 1913, 83. (E. C. M.)

**Candy Tablets.**—*A Suitable Form of Medicament for Children.*—Dr. Bernard Fantus strongly advocates the candy form of medicaments for children, to whom this form appeals when all other forms are rejected. Taking lessons from a real confectioner, after trying various expedients to determine what candy form would be most suitable for this purpose, he finally arrived at the following conclusions: (1) Candy medicine to be successful must be absolutely pleasant and must disintegrate rapidly in the mouth, for a sick child will usually not suck or chew a candy as a healthy one would. (2) Only tasteless or almost tasteless medicaments can be given in candy form. (3) The fondant is the most suitable form for the purpose of candy medication, as it disintegrates rapidly. (4) As the fondant is rather troublesome to prepare and becomes hard with age, while a lightly compressed tablet made from powdered sugar is very similar to the fondant and keeps well, the latter is evidently the practical form for candy medication. This form has already been in use for the administration of calomel and of phenolphthalein. A systematic search showed that quite a number of other medicaments could be put up in the candy form; and the use of these in practice has been so pleasing, that the author would be sorry if he had to get along without them.

He believes that candy medication has a future, but is afraid that this future will be in the form of proprietary exploitation unless pharmacists equip themselves to prepare these tablets. While pharmacists in the past seem to have been afraid to attempt tablet making, the process is in reality not difficult and can be carried out with the simple apparatus supplied for compressing them in small quantities, observing only that the punches are kept clean, free from scratches, and slightly oiled with liquid petrolatum. It takes no more time or skill to make tablets than to make pills or suppositories. Granulation of the powder before compression he finds is not necessary if about 3 per cent. of cacao butter is added to the powder, which serves at once as a cohesive, and as a lubricant preventing sticking in the die. The only objection to the cacao butter is that it is liable to become rancid, hence it is suitable only for the extemporaneous preparation of tablets. The author has found, after a little experimenting, that low-melting paraffin answers the purpose just as well as cacao butter, and does not become rancid. A further addition of 3 per cent. of talc powder is likely to become necessary to keep the tablets from "picking," *i. e.*, sticking to the punches.

The following may serve as a typical formula for a candy tablet:

## ARSENIC TRIOXIDE, 1 100 GRAIN.

Arsenic trioxide.....	1 grain
Paraffin, low melting point.....	9 grains
Talc.....	9 grains
Malachite green, 1% solution.....	10 minims
Spirit of peppermint.....	5 minims
Powdered sugar.....	281 grains

Having thoroughly triturated the arsenic trioxide with the sugar, add the malachite green solution and the spirit of peppermint and triturate until the green color is perfectly uniform. Then add the paraffin and triturate again. Finally, the talc is added, not by trituration, however, but by stirring with a spatula and the powder is ready for compression into 100 tablets, each weighing 3 grains, by using  $\frac{5}{16}$  inch die and punches.

The same formula may be used for making candy tablets of tartar emetic, calomel, mercury biniodide, mercury protiodide, mercury with chalk, nitroglycerin, elaterin, hyoscyne. Of course, other harmless coloring or flavoring may be used. For other substances, slight modifications of the above formula are mentioned, which may be consulted in the original paper. —Journ. A. Ph. A., January, 1913, 95-97.

## TINCTURAE.

**The Tinctures of the G. P. V.**—*Experimental Comparison with Those of the G. P. IV.*—Since the German Pharmacopœia V has become effective (1911), numerous criticisms regarding the tincture formulas have appeared in the pharmaceutical literature, partly because of the failure to include analytical tests for the tinctures and partly because of the retention of the old method of their preparation by maceration, slightly modified, instead of adopting the agreement of the Brussels protocol of 1906 to prepare the potent tinctures by the process of percolation. Referring to these criticisms, Rogée remarks that the objection to the formulas of the G. P. V most frequently voiced is not so much on the ground of these defects, but because of the modification of the maceration process directing the reduction of the drug to a coarse or moderately fine powder, instead of, as heretofore, reducing the drug by cutting into thin slices. It is held that the use of powdered drug does not materially increase the amount of extractive matter, but that it has the disadvantage of producing tinctures that are filtered with more or less difficulty and are more liable to deposit on keeping than those made with the finely cut drug. Moreover, the use of the latter affords a better criterion of purity than the powdered

drug, which frequently contains extraneous matter and dirt, particularly when purchased in the powdered condition.

In order to obtain some further light on this question, Mr. Rogée, using identically the same drug in each, prepared the official tinctures of the German Pharmacopœia according to the directions of the two editions, the drugs for the tinctures of the G. P. V being reduced to coarse powder in a mortar, those for the tinctures of the G. P. IV finely sliced. These were macerated under identical conditions during 8 days, shaking a few minutes 2 or 3 times daily, expressed and filtered. The specific gravity at 15° C. of the tinctures was ascertained, by the aid of Westphal's balance, and partly verified in the pycnometer for the purpose of control, and the extraction was determined by evaporating 5.0 Gm. of the tincture in a shallow dish with flat bottom, final drying to constant weight at 105° C., and final weighing after standing half an hour in the exsiccator. The results, which are exhibited in the table hereto appended, prove that the amount of extraction is higher in each case when powder is used for the maceration, but that this increase is inconsiderable. In the case of tincture of valerian the difference amounts only to 2.29% while in tincture of ginger the highest—it amounts to 19.11%. The filtration of the expressed tinctures obtained by the method of the G. P. V, using the bruised drug obtained by pounding in a mortar, presented no difficulty, exhaustion being quite as complete as when finer powder was used; nor did the tincture show any greater disposition to precipitate than when made from the finely sliced drug, as required by G. P. IV.

Tinctura.	Specific Gravity at 15° C.		Percentage of Dry Extract.		Alkaloidal Content Per cent.
	G. P. V.	G. P. IV.	G. P. V.	G. P. IV.	
Absynthii	0.910	0.910	3.700	3.516	
Aconiti	0.9055	.....	3.12	.....	
Aloes	0.894	.....	16.52	.....	
Aloes comp.	0.9065	.....	3.52	.....	
Amara	0.9165	0.9162	5.84	5.66	
Arnicae	0.9035	.....	2.00	.....	
Aromatica	0.903	0.9031	2.19	2.11	
Aurantii	0.918	0.918	6.15	5.85	
Benzoes	0.880	.....	16.02	.....	
Calami	0.9055	0.9052	2.88	2.71	
Cantharidum	0.836	.....	1.64	.....	
Capsici	0.8385	0.8381	1.68	1.57	
Catechu	0.9435	.....	12.72	.....	
Chinae	0.9175	.....	6.04	.....	} 0.762 0.38 Cinchona bark contains 6.90%
Chinae comp.	0.9185	.....	6.28	.....	
Cinnamomi	0.907	.....	2.62	.....	



Tinctura.	Specific Gravity at 15° C.		Percentage of Dry Extract.		Alkaloidal Content Per cent.
	G. P. V.	G. P. IV.	G. P. V.	G. P. IV.	
Colchici.....	0.899	.....	1.62	.....	
Colocynthis.....	0.902	.....	3.02	.....	
Digitalis.....	0.906	0.908	3.26	3.04	
Ferri pomati.....	1.039	.....	9.16	.....	
Gallarum.....	0.951	.....	12.90	.....	
Gentianae.....	0.926	0.923	7.70	6.94	
Ipecacuanhae.....	0.9025	.....	1.82	.....	0.201 (root contains
Lobeliae.....	0.902	0.9015	1.44	1.34	2.2% alk.)
Myrrhae.....	0.8405	.....	3.42	.....	
Opium benzoica.....	0.9025	.....	0.46	.....	
Opium crocata.....	0.961	.....	5.18	.....	0.9983
Opium simplex.....	0.973	.....	5.15	.....	0.992
Pimpinellae.....	0.905	0.906	2.34	2.29	
Rhataniae.....	0.919	0.916	5.79	5.58	
Rhei aquosa.....	1.015	.....	4.2	.....	
Rhei vinosa.....	1.072	.....	22.0	.....	
Scillae.....	0.915	.....	12.92	.....	
Strophanthi.....	0.899	.....	1.84	.....	
Strychni.....	0.9015	.....	1.34	.....	0.2514 (seed contained
Valerianae.....	0.9085	0.908	3.49	3.41	3.2308%)
Valerianae aether.....	0.8155	0.816	1.76	1.68	
Veratri.....	0.904	0.903	1.98	1.92	
Zingiberis.....	0.8995	0.899	1.36	1.10	

Pharm. Ztg., lviii (1913), No. 16, 354-355.

**Tinctures of the German Pharmacopœia.** Dr. P. Borisch and Fritz Kürschner in a series of papers on the preparation of these tinctures present three very valuable tables, together with one giving the result of the capillary analysis, and reached the following conclusions:

1. The change in the German Pharmacopœia from the very coarsely cut drug to the ground drug is a decided disadvantage in the preparation of the tinctures by maceration.

2. The quality of the powdered drugs in the market is not of strictly first class, as 53% prove to be not up to the standard.

3. Tinctures prepared from ground drugs are deficient in strength, owing to the presence of sand and the subsequent increased ash content in the drug.

4. It is very desirable that pharmacists should prepare their own ground and powdered drugs. Ph. Zhalle., 1913, No. 14. O. R.

**Tinctures.** *Preparation with Weak Alcoholic Menstrua.* In continuation of his previous work on the preparation of tinctures

with weak alcoholic menstrua, W. Liedtke contributes the results of comparative experiments undertaken with glucosidal and alkaloidal drugs, which convince him that such tinctures also are preferable to the corresponding tinctures made with the stronger menstrua prescribed by the G. P. V, provided they are made accurately according to the method he describes. In support of his contention he gives the results obtained with a large number of tinctures, both in detail and in the form of a comparative table.—*Pharm. Ztg.*, lviii (1913), No. 73, 727-728.

**Vinous Tinctures.**—*Experimental Inquiry Concerning Their Desirability.*—During the past year German pharmacists have discussed the proposition to utilize wine instead of diluted alcohol for the preparation of some of the official (G. P.) tinctures (see Year Book, 1912, 70), the consensus of the opinion of most of the writers being in the negative. Writing on the same subject, W. Liedtke observes that this proposed innovation being mainly on the ground of economy, it would be more reasonable to employ corresponding dilutions of alcohol with water for the extraction of certain drugs, if it should be found that the official menstruum is unnecessarily strong. The practicability of this can, however, be demonstrated only by systematic and careful experimentation, and he has therefore made a series of comparative experiments, not so much with the expectation of reaching definite conclusions, but to pave the way for others who may find the time and have the inclination to pursue the same line of investigation. Selecting the tinctures of arnica, valerian, gentian, and galls, he extracted the respective drugs under absolutely identical conditions, such as period of maceration, of temperature and of manipulation, with three different alcoholic menstrua composed: I, of 20.0 alcohol and 80.0 water; II, of 40.0 alcohol and 60.0 water; and III, of 70.0 alcohol and 30.0 water—the last being the official menstruum of the G. P. While the tinctures with menstruum III were prepared in strict conformity with the G. P. directions—7 days' maceration at the ordinary temperature—those prepared with menstrua II and I were made as follows: The drug was moistened with 20.0 alcohol, allowed to stand 2 hours, then the whole quantity of water, *hot*, was added, followed in the case of menstruum II by the remainder of the alcohol required. The effect of the *hot* water is the complete disintegration of the drug and to unlock its soluble contents quite differently from that of cold maceration. The mixture was then allowed to cool in a well-closed vessel, with frequent shaking, and then macerated for five days more. On

filtering the expressed tinctures obtained with these different menstrua, those made with III filtered rapidly and clear, II filtered with medium rapidity, while tinctures I filtered slowly, were turbid and required in some cases several filtrations. Tinctures II were the deepest in color.

In the present experiments the valuation consisted in the determination of the dry residue of evaporation—10.0 of the tincture being weighed into a watch glass, evaporated on the water bath and then dried to constant weight at 100° C. in an air bath (about 1.5 hours). The results are given in the following table:

	I	II	III	Difference,
	Per cent.	Per cent.	Per cent.	Per cent.
Tinct. Gentianæ .....	7.32	7.7	6.8	0.9
Tinct. Valerianæ .....	5.2	5.01	3.87	1.33
Tinct. Gallæ .....	13.1	13.7	12.4	1.3
Tinct. Arnice .....	1.52	1.77	1.4	0.12

Obviously, tinctures prepared with the weaker alcoholic menstrua are correspondingly cheaper—the difference being exemplified in the case of tincture of gentian as follows: I = 0.80 M.; II = 1.20 M.; III = 2.10 M.; List price = 2.70 M. The author contemplates further experiments with tinctures in which the active constituents (alkaloid, etc.) can be determined by assay, believing these experiments well worth while if they will lead to the adoption of weaker alcoholic menstrua for tinctures in cases when they are equivalent to those made with the stronger. Pharm. Ztg., lviii (1913), No. 9, 87-88.

**Tinct. Cinchonæ Comp.**—*Experimental Observations.* Prof. Gordon L. Curry conducted experiments to determine if the exhaustion of the drugs composing this tincture would be more rapidly and completely accomplished by an acid menstruum, and reports, as the result of such experiments, that apparently an acid menstruum is not superior to that at present directed. Proc. Kentucky Phar. Assn., 1913, 66-68. (E. C. M.)

**Tincture of Iodine.**—*Stability.* L. Johannessen made a great many experiments regarding the stability of tincture of iodine, together with additions of 5% of sodium chloride, 5% of potassium iodide and 5% of borax. The tinctures were kept at a temperature of 20° C. and also 37° C. and the results are reported in two very valuable tables. The author reaches the conclusion that in the ordinary tincture of iodine, that is, a solution of iodine in alcohol, the iodine content gradually decreases, owing to the formation of

ethyl iodide and hydriodic acid. He recommends the addition of 5% of potassium iodide, which produces a permanent tincture. (The same conclusions have been obtained by Prof. Charles H. LaWall, of Philadelphia, about ten years ago and have therefore been adopted in the U. S. P. VIII.)—Ph. Zhalle., 1913, No. 9. (O. R.)

**Tincture of Iodine.** *Improved Formula.* W. F. Kaiser recommends the addition of glycerin to tincture of iodine and cites these reasons therefor:

1. It is a good solvent for iodine.
2. It is miscible with both alcohol and water.
3. It seems to be a medium between the water and iodine in effecting a solution.
4. It acts as a retarding agent to irritation when applied to the skin, thereby preventing blistering to a marked degree.
5. It is non-volatile, thereby retaining the iodine in solution, and with the water causes it to spread smoothly.
6. It keeps well and gives better satisfaction to the user.

He mentions the following objections to the use of alcohol undiluted in the preparation of this tincture:

1. It has a greater affinity for water than glycerin and leaves the cutaneous surfaces in a hard, dry condition.
2. It is very volatile, evaporating and permitting the direct action of the iodine upon the skin, thus producing irritation and vesication.
3. It does not spread smoothly.
4. It is very irritating when applied locally and especially so when brought into contact with an open wound, thereby curtailing its usefulness in surgery.

He recommends the addition of 150 Cc. of glycerin to 850 Cc. of a tincture made by the following formula:

Iodine.....	70 Gm.
Potassium iodide.....	30 Gm.
Distilled water.....	100 Cc.
Alcohol, q. s., ad.....	850 Cc.

Dissolve the potassium iodide in the water, add glycerin and to this add the iodine and lastly the alcohol.—Proc. Wisconsin Phar. Assn., 1913, 55-56. (E. C. M.)

**Tincture of Iodine.** *Preparation by Percolation.* Wm. S. White highly recommends E. A. Geyers' method of making tincture of iodine, by pouring the alcohol on the iodine and potassium



iodide, which have been placed on a pledget of cotton in a glass funnel, and collecting the percolate in a graduated bottle. He regards this as a great improvement over the U. S. P. method, but suggests as a further improvement to rub the potassium iodide to a very fine powder, otherwise it will be necessary to return the percolate to the funnel to complete the solution. *Journ. A. Ph. A.*, August, 1913, 939.

**Tincture of Iodine.**—*Commercial Variation.*—L. F. Kebler finds as the results of analysis of a number of samples of tincture of iodine, collected in the District of Columbia, that there is a wide variation in the iodine and potassium iodide contents, ranging anywhere from 1.97 Gm., to 9.26 Gm. iodine per 100 Cc., and from no potassium iodide to 6.82 Gm., per 100 Cc.

He asks what should a reasonable variation from the standard be, in order to be "reasonable, fair and just to the manufacturer, the consumer, and the physician." *Journal Ind. and Eng. Chem.*, June, 1913, Vol. 5, 484. (L. A. B.)

**Tincture of Iodine.**—*Specific Gravity Method of Determining Alcohol.*—J. W. Marden describes a short and reliable method for determining the percentage strength of the alcohol used in preparing a tincture of iodine, which depends on the calculation of its specific gravity by the aid of experimentally determined factors. It was found in the South Dakota State Food and Drug Laboratory that a correction factor could be obtained for varying amounts of either potassium iodide or iodine when dissolved in alcohol, so that the weight of a given volume of alcohol could be calculated by subtracting the increase in weight due to either. This factor for any given volume consists in the weight change due to one gram of the added substance dissolved in 100 Cc. of alcohol. It is very obvious that each substance must have its own factor. If the factor be multiplied by the number of grams of iodide per 100 Cc. as the case may be, the weight of alcohol used in the preparation is found by subtracting both from the weight of the given volume of the tincture. For his experiments the author used a specific gravity apparatus made from a 5 Cc. pipette. This at 20° C. holds 4.7050 Gm. of distilled water. For this apparatus the factor for the increase of weight due to 1 Gm. of potassium iodide dissolved in 100 Cc. of alcohol is equal to 0.0365. The increase of weight due to 1 Gm. of iodine dissolved in 100 Cc. of alcohol is 0.0333. Mixtures of water and alcohol were prepared and the percentage of alcohol determined by the specific

gravity. Tinctures were then made up with these, using known weights of iodine and potassium iodide, the specific gravity of each tincture determined, and from this the specific gravity of the alcohol used in the preparation calculated. The details of the method, which the author claims to give results that check to 0.3 per cent., as shown in a table accompanying his paper, must be consulted in the original.—*Journ. A. Ph. A.*, November, 1913, 1464-1466.

**Tincture of Iodine.**—*Convenient Method of Determining Acidity.*—P. Carles, having occasion to determine the acidity of a sample of tincture of iodine which had been exposed to diffused daylight in a colorless glass bottle for 10 months, adopted the following method: 50.0 Gm. of the tincture were mixed with 400.0 Gm. of distilled water, allowed to stand one hour, then filtered. Some pure, washed barium carbonate was added to the filtrate, thus forming soluble barium iodide. The excess of barium carbonate is removed by filtration and the filtrate precipitated with sulphuric acid, 100.0 barium sulphate corresponding to 109.0 hydriodic acid. In this way the sample under examination was conveniently determined to contain 1.42 per cent. HI.—*Pharm. Ztg.*, lviii (1913), No. 63, 623; from *Journ. de Pharm. et Chim.*, 1913, No. 2.

**Stronger Tincture of Iodine.**—*Preservation and Assay.*—The Swedish Pharmacopœia includes a strong tincture of iodine of the formula:—Iodine, 10 Gm.; absolute alcohol, 45 Gm.; rectified spirit, 45 Gm.; and a tincture of iodine of the formula:—Iodine, 5 Gm.; rectified spirit, 95 Gm. As the result of some investigations, a writer in "*Svenst. Farmaceutist. Tidskrift*" (Nos. 5, 6 and 8) makes the following recommendations: (1) The addition of 3.5 per cent. of potassium or sodium iodide to the strong tincture and of 1.75 per cent. to the tincture is necessary for keeping purposes. In this case the use of absolute alcohol in making the strong tincture is unnecessary. (2) The stock of tincture of iodine must be kept in the cellar in a stoppered bottle. The stopper should be tied over with bladder or covered with a glass cap ground on to the bottle. (3) In assaying the tinctures, the quantity of hydriodic acid as well as of free iodine must be determined, either by titration with decinormal caustic soda solution or by the iodate method. The highest permissible amount of hydriodic acid is 0.2 per cent. It is suggested also that the 10 per cent. solution should be named tincture of iodine, in uniformity with other pharmacopœias, the other preparation being

distinguished as weak tincture of iodine. *Pharm. Journ. and Pharmacist*, May 17, 1913, 699.

**Tinct. of Iodine.** *Use in Surgery.* Frederick E. Neice says that *Tinct. iodine* is the one tincture beyond compare for use in surgery. He gives an interesting historical account of its surgical use and names many surgeons who have held it in high esteem as an ideal disinfectant and antiseptic. He quotes from a report of Maj. Frank A. Woodbury of the Medical Corps, U. S. A., which gives the history of six cases in which iodine was the only antiseptic and disinfectant used. Major Woodbury says: "Tinct. iodine is the most valuable drug that railroad and military surgeons can have. A good surgeon and Tinct. iodine will show as good results as the finest marble-lined operating pavilion served by the most scrupulous followers of Lister."—*Proc. N. Y. Phar. Assn.*, 1913, 227-230. (E. C. M.)

**Camphorated Tincture of Opium.** *Convenient Method of Preparation.*—Wm. S. White can see no good reason for making camphorated tincture of opium from granulated opium and having to wait three days for it to macerate, when it can be made in a very short time by using an equivalent amount of tincture of opium. By dissolving the benzoic acid, camphor and oil of anise in about 10 per cent. of the alcohol, and adding this gradually, with stirring, to a mixture of a greater part of the dilute alcohol, the tincture of opium and the glycerin, and then adding gradually an amount of water equal to the alcohol used at first and finally adding dilute alcohol in quantity sufficient, and filtering, an excellent tincture can be made in a very short time.—*Journ. A. Ph. A.*, August, 1913, 939.

**Deodorized Tincture of Opium.** *Paraffin as a Deodorant.*—Wm. S. White much prefers paraffin to purified petroleum benzin as a deodorant for this tincture, finding it both convenient and reliable, while the disagreeable odor of the benzin and the danger of an explosion from the ignition of its vapor are avoided. About 70 Gm. of paraffin to a liter of tincture is sufficient. It should be melted and added to the hot evaporated extract, stirred well, allowed to remain over night and then removed in a solid cake. In assaying the tincture made by this method, the author noticed that the morphine is remarkably white and pure. *Journ. A. Ph. A.*, August, 1913, 939.

**Tinct. Opii Deodorati.** *Simple Process of Preparation.*—Joseph W. England says that the objection to the official method of making

this preparation is that it is tedious to carry out and the product, unless very carefully made, is apt to have a benzin odor. He says that, in his judgment, the simplest and best procedure is to make the preparation directly from deodorized opium as advocated by the late Prof. Maisch. He recommends the following method:

Deodorized opium (12-12.5% morphine).....	100 Gm.
Alcohol.....	200 Cc.
Water, a sufficient quantity to make.....	1000 Cc.

To 1000 cubic centimeters of *cool* water in an evaporating dish gradually add 100 Gm. of deodorized opium, mix and heat on a water bath for six hours, replacing the water lost by evaporation. When cool, pour the mixture as evenly as possible, upon a wetted, non-fluted paper in a funnel, returning the first portion of the percolate until it runs clear. Then percolate the residue on the filter with water until the percolate passes colorless and is only faintly bitter. Concentrate the percolates on a water bath until they measure seven hundred cubic centimeters, cool, add two hundred cubic centimeters of alcohol, and filter through a paper filter. Assay the final product by the process given under *Tinct. opii* of the U. S. P. and adjust the volume of preparation, by the addition of water, so that each 100 Cc. shall yield not less than 1.2 nor more than 1.25 grams of crystallized morphine. By making the final volume 900 Cc. and assaying, the product can be most readily standardized.—Proc. N. J. Phar. Assn., 1913, 89-91. (E. C. M.)

**Tinctura Rhei aquosa, G. P. V.** —*Liability to Precipitate.*— Having frequent occasion to supply *tinctura rhei aquosa* in quantities of several hundred grams, Dr. Robert Frey found that in contrast to the experience when dispensing the tincture made according to the G. P. IV, which contains borax, the preparation now made according to the formula of the G. P. V, was rarely clear unless it happened to be just prepared. The slight turbidity of the new preparation could, however, be removed by gently heating it in the water bath if the demand was sufficiently frequent for its rapid disposal, but when the demand was infrequent, the precipitate subsided to the bottom, forming a coarse-grained crystalline deposit which could be dissolved only partially, even by boiling. The author attributes this to the omission of borax in the G. P. V formula, this addition being no longer permitted, but he finds that by the addition of 5 Gm. of crystallized sodium carbonate, in addition to the 10 Gm.  $K_2CO_3$  prescribed, a fairly permanently clear preparation may be obtained. The author's observation is of



additional interest inasmuch as it points out the changes that may occur in the precipitates formed in this and similar preparations on prolonged standing—changes which may possibly be avoided by frequently shaking the preparation while on the shelf. He directs attention also to the necessity of avoiding the presence of fragments of the rhizome in the strained tincture, which is difficult to filter and can be clarified only by decantation—a process which becomes very tedious if rhizome particles are present. *Pharm. Ztg.*, lviii (1913), No. 17, 166-167.

**Deoleated Tincture of Strophanthus.** *Advantages over the U. S. P. Tincture on Clinical Grounds.*—R. C. Holmes observes that the clinician's principal objections to tincture of strophanthus are that its nauseating properties, although less than those of tincture of digitalis, produce untoward effects, and that oftentimes the preparation fails to give results. Impressed with the surmise that the presence of the fixed oil in the official tincture may be the disturbing factor, the author has extracted the oil from the seed and investigated its pharmacological properties, of which he has been unable to find any record in the literature, supplementing his investigations by clinical observations with U. S. P. and deoleated tinctures. The results showed that when administered to a dog (5 Kgm. in weight) in doses of 20 minims, of the fixed oil, the animal became very uneasy, and evidently suffered from severe pain, while in doses of 30 minims, it was followed by emesis which was very pronounced. Doses, varying from 5 to 15 minims, invariably produced symptoms of gastro-intestinal disturbances, varying with the amount of the dose; vomiting, however, is not produced with doses smaller than 30 minims in a small dog.

On the other hand, clinicians reported that the deoleated tincture undoubtedly possessed less irritating properties than the U. S. P. tincture, and in every way was a more desirable preparation.

The fixed oil was extracted from the seed with chemically pure petroleum ether, in a yield of 34% of the drug. It was dark brown in color and possessed the following constants: Sp. gr. at 25° C., 0.9018; acid number, 19.44; sapon. number, 187.52; iodine number, 95.63. —*Journ. A. Ph. A.*, June, 1913, 713-715.

#### TROCHISCI.

**Fruit-Paste Lozenges.** *Formulas of the B. P. and of the Throat Hospital Pharmacopæia.*—In a "Chapter on Practical Pharmacy," it is stated that seventeen lozenges are official in the British Pharmacopæia, four distinct bases—*fruit*, *rose*, *simple*, and *tein-basis*—

being described for their preparation; the required medicament being mixed with one of these, but their shape, size, and weight are not specified. The official instructions for making lozenges with a fruit basis are as follows:

"Take 500 times the quantity of drug ordered for one lozenge, mix it intimately with  $15\frac{1}{2}$  ounces of refined sugar in fine powder and 300 grains of gum acacia in powder. Make the mixture into a paste with  $1\frac{1}{4}$  fluid ounces of mucilage of acacia and 2 ounces of the black currant paste of commerce, previously softened with boiling distilled water; add more distilled water if necessary. Divide the mass into 500 equal lozenges. Dry them in a hot-air chamber at a moderate temperature."

Obviously, the weight of the lozenges, while corresponding among themselves, must vary according to the quantity of medicament contained in each lozenge. Moreover, the black currant paste being a commercial article, and no directions given for its preparation, this is supplied by manufacturers in two or three qualities—the lowest-priced containing a considerable quantity of sugar; but a very good paste is said to be made by adding 1 ounce of gum acacia to 1 pint (Imp. meas.) of black currant juice, evaporating the mixture to a syrupy consistence, and then mixing it with an equal weight of powdered sugar.

These fruit-paste lozenges of the B. P. do not contain a large proportion of fruit-paste; hence they, in common with the other official lozenges, are made with a smooth surface, which is usually dusted with starch. They were, however, evidently suggested by the

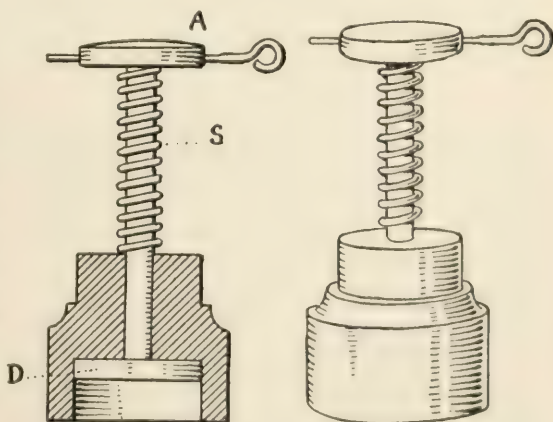
**Lozenges of the Throat Hospital Pharmacopœia**, which, with the exception of these containing carbolic acid, are made with either

**Black-Currant or Red-Currant Paste.** In the past experience of the reporter, he found it difficult to obtain any reliable information regarding the precise nature of these "fruit-pastes," as well as other information respecting their preparation, and that of the lozenges themselves, which were distinctly different from ordinary lozenges and were in popular demand by American physicians. Hence he believes that he is warranted in giving the following details respecting them, in order to fill a gap in American literature, which he had missed sorely, as will doubtless be appreciated by others: "The paste (from both black and red fruit) was formerly directed to be made by boiling 7 lbs. of currants with 1 pint of water, the berries being crushed with a pestle until the mixture is thoroughly pulped; the mass is then passed through a sieve and is beaten

into a paste with from 3 to 4 lbs. of powdered sugar. In the present edition of the Throat Hospital Pharmacopœia no directions are given for the preparation of the paste. The Throat Hospital lozenges contain from 70 to 80 per cent. of fruit paste, 1 to 2 per cent. of powdered tragacanth, 4 per cent. of sugar, and a varying quantity of the medicament. They are directed to be prepared by mixing together the dry ingredients for 350 lozenges, then adding the currant paste until the mass weighs 1 lb., which is then divided into lozenges weighing 20 grains each, which are subsequently dried in a hot-air chamber at a moderate heat. Lozenges made according to these directions are much softer than the fruit-paste lozenges of the British Pharmacopœia, which are prepared with a considerably smaller percentage of black-currant paste. Different customs prevail among manufacturers, but usually the Throat Hospital lozenges are made oval in shape and they possess a rough surface, finely crystallized sugar being sprinkled over the lozenges in order to prevent them sticking to the slab during the stamping out process. According to the directions in the Throat Hospital Pharmacopœia the lozenges are usually marked with one or more letters, which indicate their composition." For the convenient preparation of these

**Soft Fruit-Paste Lozenges,** C. T. Allan has devised an ingenious apparatus (Fig. 54), which consists of a circular brass mold, the bottom of which is formed by a well-fitting disc attached to a rod and spiral spring, S. The mold holds about 35 grains of mass, so that twelve lozenges can be made from about 1 ounce of fruit paste mixed with the prescribed medicament or combination of medicaments. Black currant lozenges form a very good substitute for the fruit paste supplied by manufacturers, and will always be at hand. The

FIG. 54.



Fruit Lozenge Mold.

ingredients should be incorporated in a mortar just as in the preparation of a pill mass; the inside of the mould is then well dusted with powdered sugar, and enough of the paste is pressed into the mould to fill it. The surface is cut level with a knife, and then the lozenge is forced out by pressing the plate A, and thus forcing out the disc D level with the sides of the mould. This process can be repeated rapidly, and small quantities of lozenges can be dispensed elegantly and expeditiously. The appearance of the lozenges is improved by dusting each one with powdered sugar, or with finely broken crystals, and stamping each one with an ordinary sealing wax seal. The mould can quite easily be taken to pieces and cleaned. *Pharm. Journ. & Pharmacist*, March 1, 1913, 291-294.

#### UNGUENTA.

**B. P. Ointments.** *Original Suggestion of the Formulas and Suggestions Thereon.* E. W. Lucas contributes an interesting paper on the original suggestions upon which the formulas for the ointments in the revised edition of the British Pharmacopœia are based, and, in juxtaposition, mentions the comments and suggestions that have since been made by numerous writers in all parts of the British empire. Broadly speaking, his suggestion that two bases only are required (see Year Book, 1912, 74), the one protective, the other emollient, both bases modified to suit varying climatic conditions, has been approved in all the reports received. *Chem. and Drugg.*, March 22, 1913, 438-439.

**Oxycholestrin Ointment Bases.** *Characters and Utility.* J. Roemer discusses the pharmacy of the so-called oxycholestrin ointment bases which have recently been described by Dr. Unna as possessing significant value in the therapeutics of ointments. In so far as the chemistry applies to these compounds, little appears in the literature. The first question that presents itself is what are the iso- and oxy-cholestrins which impart the all-important property on account of which they find special usefulness. The nearest we can get to the answer for this is that they are said to be waxy alcohols, to which has been assigned the alcohols of an homologous series, perhaps included in the group starting with the formula  $C_{10}H_{20}O$  and ending with the formula  $C_{26}H_{54}O$ . It appears further from the statements of Dr. Unna that a mixture of these waxy alcohols is obtained through a process of alcoholic saponification and fractional distillation from the washings of wool fat, but that they are not supplied as such, but are mixed with certain proportions of neutral ointment bases to which they impart the



desired therapeutic properties, namely, the ability to combine with water up to as much as 500 per cent. holding the desired medicament in solution. It appears further that the ointment base at present supplied consists of 5% of free alcohols of the iso- and oxy-cholestrin group, and 95% of petrolatum, and that this is known as *Anhydrous Eucerin*, and that this, in turn, when hydrated (*Eucerinum cum aqua*) is commercially known as *Eucerin*. Mr. Roemer in the present paper records some interesting experiments and observations respecting the pharmacy of these products, which must be consulted in the original.—*Journ. A. Ph. A.*, January, 1913, 97-101.

### Simple Cerate of the Swiss and of the German Pharmacopœias.

*Comparison.* H. Rordorff calls attention to the difference in manufacture of the *unguentum cereum* or simple cerate of the Swiss and German Pharmacopœias. While the Swiss recipe calls for a fused ointment of olive oil and white wax, benzoinated with an ethereal tincture of benzoin, the German Pharmacopœia directs a combination of peanut oil and yellow wax without benzoinating. Rordorff finds two objections to the Swiss recipe:

First.—The product is so different from the German preparation that a German prescription calling for "*unguentum cereum*" compounded in Switzerland is apt to give dissatisfaction to the customer. Again, the cerate is considered by most physicians as an indifferent ointment base and as such is frequently prescribed in eye salves. The benzoinating adds to the cerate benzoic acid and also resins, which frequently cause irritation to the eyelids. *Schweiz. Wschr. f. Chem. u. Pharm.*, 51 (1913), No. 30, 441. (H. V. A.)

**Ointments.** *Microscopic Examination.* Fritz Heidelberg and Charles E. Vanderkleed say that the only satisfactory method of determining whether or not the proper degree of sub-division of the active ingredients of ointments has been attained, is by a microscopic examination of the finished product. But they call attention to some of the precautions which the microscopist should observe, even in so apparently a simple task as this, and they give comprehensive instruction as to the conduct of such observations. The article is illustrated by many plates, showing microscopic views of samples of mercurial ointment, taken under differing conditions.

*Proc. Penn. Phar. Assn.*, 1913, 312-324. (E. C. M.)

**Borated Ointment.**—*Estimation of Boric Acid.* R. Weinland and Fr. Ensgraber recommend the following method for determin-

ing the boric acid in borated (vaseline) ointment: About 0.2 Gm. of the ointment, accurately weighed on a small piece of parchment paper, is placed into a separatory funnel with 50 Cc. of benzin, and the solution of vaseline produced shaken out successively with 50-25-25 Cc. of water. The united aqueous solutions are then mixed with 50 Cc. of glycerin, and the monobasic glyceroboric acid formed is titrated with 1 10 N sodium hydroxide solution (as free from carbonic acid as possible), using phenolphthalein as indicator. The titration is ended when the red color finally produced remains unchanged during two minutes. To assure the absence of acidity in the glycerin used for the experiment, the experiment is repeated with 50 Cc. of the glycerin by itself, moderately diluted, and the number of cubic centimeters of alkali V. S. consumed, if any, is deducted from the number originally consumed -1 Cc. of 1 10 N soda solution corresponding to 0.0062 Gm. of boric acid.—Pharm. Ztg., lviii (1913), No. 75, 749; from Südd. Ap. Ztg., 1913, No. 70.

**Camphor Ointment.**—*Adulteration with Starch.*—W. Dulière examined a number of commercial samples of camphor ointment and found most of them to contain less camphor than is demanded in the Belgian Pharmacopœia. Two samples from one firm were adulterated with starch, one of them containing 7.2% of camphor and 15% of starch, the other 5.56% of camphor and 17% of starch.—Pharm. Ztg., lviii (1913), No. 82, 820; from Journ. de Pharm. d'Anvers, 1913, No. 16.

**Ung. Diachylon.**—*New Formula.*—A correspondent of the Apoth. Ztg. (1913, No. 84) proposes the following formula for preparing diachylon ointment: Equal parts of anhydrous lead-plaster and liquid paraffin are melted together on the steam bath and stirred until cool. After setting aside in a cool place for 24 hours, the ointment is again thoroughly stirred. It should be prepared only in quantities that are soon used up.—Pharm. Ztg., lviii (1913), No. 90, 901.

**Iodide of Potassium Ointment.** *Determination of Iodine.*—R. Weiland and Fr. Engraber recommend the following method for determining the iodine in iodide of potassium ointment: About 0.2 Gm. of the ointment is accurately weighed on a little parchment paper, placed into a separating funnel of about 250 Cc. capacity and a mixture of 25 Cc. of ether and 25 Cc. of benzin is added. When the fat is dissolved, 100 Cc. of water are added, well shaken, allowed to separate, and drawn off into a 300 Cc.

Erlenmeyer flask, this shaking out being repeated two or three times, each with 50 Cc. of water. In case the ethereal or aqueous layer has shown a yellow color, due to liberated iodine, about 2 to 3 Cc. of 1/10 N sodium thiosulphate are added, and the liquid is boiled during half an hour with about 10 Cc. of diluted sulphuric acid, a pinch of powdered pumice being added to prevent bumping. After cooling, 25 Cc. of 1/10 N silver nitrate solution are added, and the excess is titrated back with 1/10 N ammonium sulphocyanide, using 5 Cc. of ferriammonium sulphate T. S. as an indicator. 1 Cc. 1/10 N  $\text{AgNO}_3 = 0.0166 \text{ KI}$ .

By this method of titration, however, the partial replacement of iodide by chloride will escape attention. To assure its absence, a small portion of the ointment is treated separately as before with ether and water, and to the aqueous solution an excess of silver nitrate is added and filtered. On acidulating the filtrate with diluted nitric acid, opalescence may result, but no precipitation. Pharm. Ztg., lviii (1913), No. 75, 748; from Südd. Ap. Ztg., 1913, No. 70.

**Irritating Ointment of Yellow Mercuric Oxide.**—*Caused by Mercuric Chloride.* Dr. T. Knapp reports that a sample of ointment of yellow mercuric oxide (one per cent.) was brought to him by a physician for examination, the ointment having produced serious inflammation when applied to the eyelids. The ointment was found to contain mercuric chloride, due undoubtedly to careless preparation of the mercuric oxide, this chemical being either made by adding an insufficient amount of alkali to mercuric chloride or else it was not washed thoroughly after precipitation.—Schweiz. Wschr. f. Chem. u. Pharm., 5 (1913), No. 49, 749. (H.V. A.)

**Sulphur Ointment.** *Preparation by Heat.* L. Sabbatani has made experiments on the preparation of sulphur ointment, which demonstrate that sulphur ointment prepared by melting the ingredients together possesses a much finer division of the sulphur than when the ointment is prepared by simple trituration. This is due to the fact that the sulphur is in an amorphous semigranular condition, minutely divided, whereas, when prepared by trituration, the sulphur retains its crystallinity. Sulphur ointments prepared with heat, however, with the exception of those made with a paraffin base, are not definitely stable; they soon assume the crystalline character inherent to ordinary sulphur.—Pharm. Ztg., lviii (1913), No. 99, 989; from Kolloid. Ztschr. (1913), No. 5.

**Unguentum Zinci Oxidi.** *Analysis.* Mr. Joseph L. Mayer recommends the following process as being accurate and easily applied for the determination of the zinc oxide content of this ointment: Into a tared porcelain crucible, accurately weigh one gram of the sample, heat cautiously until the material bursts into flame, allow to burn quietly until all inflammable material is consumed, then heat strongly with the Bunsen burner until all organic matter is burned off. Cool and weigh. Should difficulty be experienced in burning off organic matter, moisten with a drop of nitric acid, heat cautiously to avoid spattering and then with the full flame as before. Since 1 Gm. of the sample is taken, the residue, which is oxide of zinc, can easily be computed into percentage by multiplying the result by one hundred. The same method can be applied to the analysis of zinc stearate ointment. - *Proc. N. Y. Phar. Assn.*, 1913, 226. (E. C. M.)

#### VINA.

**New Malt Wine.** *A Commercial Substitute for Grape Wine.* At the recent Congress of Vintners, held in Mainz, Dr. Hecker, the Mayor of Barr, in Elsass, called attention to a malt wine, the technical production of which has been so improved that it is difficult to distinguish it from ordinary genuine grape wine, either by wine dealers, vintners or publicans - none of the latter to whom it was submitted being able to distinguish it from the genuine beverage. The malt wine heretofore exploited as a substitute for grape wine was a sweet wine and was readily distinguished from the sweet grape wines of commerce. But that now produced is a dry wine and as such has all the physical properties, such as appearance, color, taste and flavor, of the corresponding dry grape wines (table wines) of commerce. The new malt wine must therefore be regarded as a (commercially) dangerous substitute for true grape wines, and the discussions at the Congress naturally centered on ways and means to restrict its use, and on methods to neutralize the untoward influence which it has manifested on the legitimate wine trade. *Pharm. Ztg.*, lviii (1913), No. 74, 738.

**Pepsin Wine, G. P. IV.** *Clarification and Manipulation.* H. Haeielin, discussing the clarification of pepsin wine, observes that on the addition of the prescribed quantity of *tinct. aurantii* a faint turbidity is produced which cannot be removed by filtration. He therefore suggests to replace the tincture by the corresponding amount of *exup. aurantii cort.*, deducting the same quantity of



simple syrup from that directed in the official formula. Regarding the manipulation, the pepsin should not be mixed directly with the glycerin and HCl, as was directed in the G. P. IV, but should be added to the previously prepared mixture of the other ingredients, thus avoiding the formation of a slimy, difficultly filterable mixture and the injurious action of the strong HCl upon the pepsin. Filtration is best effected by the use of Seitz's wine asbest-filter, which yields an absolutely bright filtrate at once. Pharm. Ztg., lviii (1913), No. 48, 472.

**Pepsin Wine.** *Clarification with Milk.*—According to the investigations of O. Richter the proposed clarification of pepsin wine with skim milk is free from all objection, and preferable to the use of talc or bole commonly recommended for this purpose unless they are purified by previous treatment with acids. Regarding the clarification with skim milk, the author observes that the milk should be boiled and again cooled before it is added to the wine, 2 per cent. being sufficient for small quantities and less for larger quantities of the preparation. After standing two or three hours it is poured on the filter, being first well shaken before each addition, the filter kept completely filled, and the filtrate returned until it passes absolutely bright. To facilitate this it is advisable to use a double filter and when large quantities are to be filtered also a flannel cloth filter. Apoth. Ztg., xxviii (1913), No. 40, 352.

**Pepsin Wine and Solutions.** *Objections to Extemporaneous Preparation.*—Carl Theod. Hackenberg observes that the practice prevailing in some pharmacies to keep in stock concentrated pepsin solutions containing hydrochloric acid for the extemporaneous preparation of pepsin mixtures is reprehensible, because the destructive effect of the hydrochloric acid in such concentrated solutions on the physiological activity of the pepsin manifests itself in a short time. Experimentally he has found that a solution of 5.0 pepsin, responding to the requirements of the G. P., 4.0 water and 1.0 hydrochloric acid, became dark brown within two weeks and nearly black in the course of 6 weeks, while its digestive action on albumen was reduced to 58.8% of the required amount on application of the official test. Pepsin wine should therefore be prepared in strict conformity with the directions of the G. P. To obtain a permanently clear product, however, it is advisable to clarify the sherry wine with a little 1 : 40 aqueous solution of gelatin, filtering the detannated wine so obtained before its

addition to the other ingredients. Pepsin wine should, however, not be prepared in quantities greater than needed for 3 months' supply. Commercial pepsin solutions in glycerin, containing no hydrochloric acid, are not subject to the author's strictures.—Pharm. Ztg., lviii (1913), No. 60, 592.

#### MISCELLANEOUS PREPARATIONS.

**Lubricant.**—*Chondrus Crispus Jelly.*—As a lubricant for surgeons' gloves and instruments, Clarissa M. Roehr, recommends a sterile jelly made from 30 parts of *Chondrus crispus* and 1000 parts of distilled water. The mucilage is made in the customary way and evaporated to the desired volume, then 2% of phenol added. This sterile lubricant is dispensed in sterile collapsible tubes or jars and has the advantages of keeping well, of being smooth, non-greasy and perfectly clear. Pac. Pharm., April, 1913, 289. (C. M. S.)

**Metal Polish.**—*A Substitute for "Geolin."*—According to Scheemann, the following formula produces a preparation very much similar to Geolin, a well-known metal polish:

Tallow soap.....	5	parts
Water.....	20	parts
Oleic acid.....	5	parts
Ammonia water.....	2.5	parts
Precipitated chalk.....	25	parts
Denatured alcohol.....	10	parts
Water.....	30	parts

Pharm. Post, 1913, 718. (O. R.)

**Ink.** Ink dates back to ancient times but its manufacture was materially improved when in 1785 the Swedish apothecary Scheele discovered gallic acid. A further step of advancement was made when in 1793 Deyeux discovered tannic acid. During the first decades of the 19th century the preparation of ink was chiefly based upon empirical recipes. One of the chief difficulties was the prevention of the formation of mold in ink. About 1830 the problem of preparing a durable and lasting ink was begun. Between 1831 and 1837 a commission appointed by the French Government recommended the use of India ink, together with the addition of diluted hydrochloric acid or a solution of manganese acetate.

Berzelius, the great Swedish chemist, in 1832, recommended a combination of an extract of nut gall together with ammonium vanadate, which ink, however, possessed the disadvantage of fading in time. The German Apothecary, Runge, made the valuable

discovery that an extract of logwood together with a very small quantity of yellow potassium chromate produces a blue-black lasting ink of neutral action which did not attack the steel pens. All these inks thus far contained iron tannate or iron gallate which was kept in *suspension*. The introduction of an alizarine ink by Leonhardi, of Dresden, in 1856, brought about a complete revolution in the chemistry of ink. Alizarine ink contains iron tannate or iron gallate in a *clear solution*. The addition of indigo sulphuric acid acted as a fixative for the ink on top and even to the paper. About 1860, aniline inks were introduced, which, however, are not very lasting. —Zeitschr. für angew. Chem., 1913, No. 27. (O. R.)

**Hair Dyes: Preparation and Examination.** The following newer chemicals are used in the preparation of hair dyes: Paraphenyldiamin, diamidophenol, pyrogallol, gallic acid, and henna. Hair dyes containing the first chemical are generally dispensed with a bottle of hydrogen peroxide, which latter can be easily recognized by the blue color when agitated with ether and a small crystal of chromic acid.

Cerbeland proposes the following tests for the recognition of hair dyes: To 5 cc. of the dye add 5 drops of Javelle water and 1 drop of 10% hydrochloric acid. A green color indicates the presence of paraphenyldiamin, a raspberry-red color that of diamidophenol, yellowish brown that of pyrogallol, dark red to black the presence of gallic acid. No change takes place when henna is present.

Solution of ferric chloride produces an olive-green color in the presence of henna, green in the presence of paraphenyldiamin, which latter color, however, changes to dark green and even violet-blue. Paraphenyldiamin can also be determined on account of the blue color which is produced when brought in contact with *raw* milk and hydrogen peroxide. —Bollett. Chim. Farm., 51, 1912, 300. (O. R.)

**Cement for Pestles.**—An excellent cement for pestles which stands heat and cold, acids and alkalies, is obtained by mixing litharge with sufficient glycerin to form a paste. This cement becomes very hard and for that reason must be freshly prepared when needed. —Suedd. Ap. Ztg., 1913, No. 100. (O. R.)

**Cement.**—*For General Use.*

Plaster of Paris.....	4 parts
Powdered acacia.....	1 part
Saturated solution of borax.....	q. s.

The plaster of Paris and the powdered acacia are rubbed together and formed into a thick paste with a cold saturated solution of borax.

This cement can be used for glass, porcelain, stone, wood, etc., and serves as a cement for general use. It has the advantage over other cements because it does *not* harden immediately. Suedd. Ap. Ztg., 1913, No. 98. (O. R.)

**Starch Paste.** An excellent and durable starch paste is obtained as follows: 75 parts potato starch are moistened with 30 parts of alcohol, then mixed with 120 parts of cold water. This mixture is gradually added to 1,000 parts of boiling water, and as soon as the mixture boils, a solution of 7.5 parts of alum in 15 parts of warm water is added and the boiling is continued until the whole mixture is of pasty consistency. Suedd. Ap. Ztg., 1913, No. 98. (O. R.)

**Infant Foods.**—*Mycological Examination.*—Dr. Hugo Kühl examined a number of German baby foods and calls attention to the fact that they are very easily contaminated during their preparation. He considers it necessary that the manufacturers use hygienic methods in the preparation, and, furthermore, that a systematic bacteriological supervision be exercised as to the rooms in which the food is manufactured and as to the food itself. Ph. Zhalle., 1913, No. 6. (O. R.)

## D NEW REMEDIES AND TRADE-NAMED PREPARATIONS

**Acetan** is the trade name given to an 86% *formic acid*, which is exploited by a Hungarian drug firm as a substitute for concentrated acetic acid for the preservation of food and for the preparation of table vinegar. It is claimed that this preparation is declared by the official chemist at Budapest to be innocuous and suitable for these purposes, but the Austrian Department of the Interior warns against the use of this product. Pharm. Ztg., lviii (1913), No. 21, 210; from Oesterr. Sanitätsw.

**Acetonal-Hæmorrhoidal Suppositories** contain 10 per cent. of acetonechloroformsalicylic acid ester and 2 per cent. of alsol (*aluminium aceticotartaricum*), combining the analgesic and disinfectant action of the first named with the astringent and antiseptic properties of alsol. Inserted in daily doses of 2-3 suppositories they are hæmostatic, relieve pain and accelerate the healing process. Allgem. Med. Central-Ztg., 1913, No. 17.



**Acetylin** is the protected name given to tablets of acetyl-salicylic acid.

**Adhaesol "Dreuw"** is an ointment like plaster mass with a lanolin basis and without rubber, possessing strong adhesive properties, which when liquefied on the water bath may be combined with any desirable medicament—tar, chrysarobin, pyrogallol, tumenol, ichthyol, sulphur, etc. In use the liquefied plaster is applied in a thin layer upon the affected surface and covered with cotton, parchment paper, or cambrie, thus producing a very adhesive bandage.—Pharm. Ztg., lviii (1913), No. 57, 563.

**Adigan** is a new digitalis specialty which is characterized by the elimination of digitonin and saponin-like constituents by precipitation in cholestrin. According to Fränkel and Kirschbaum, the product, while retaining its normal activity, is by this treatment deprived of the toxic side effects inherent to the ordinary digitalis extracts.—D. Med. Wschr., 1913, No. 18.

**Agasol** is the name given to purified agar-agar, forming a clear solution and intended for conveniently producing a culture medium. One gram of agasol suffices for 100 Gm. of nutrient jelly. Pharm. Ztg., lviii (1913), No. 39, 388.

**Agobilin** is the name given to a remedy recommended for the initial treatment of gallstone formation, which is supplied in form of tablets, each containing 0.12 Gm. of cholic and salicylic acid combined with strontium and a small quantity of phenolphthalein acetate (0.04 Gm. *pro dosi*). Dose, 2 tablets morning and evening.—Pharm. Ztg., lviii (1913), No. 45, 447.

**Aguma** is the name given to a nutrient preparation obtained from soy beans, constituting a fine, agreeably tasting powder, readily soluble in water. Pharm. Ztg., lviii (1913), No. 94, 940.

**Albyl** is the name given to a specialty which according to Madson is composed in rounded figures of 54% acetyl-salicylic acid, 29% sodium salicylate, 16 to 17% casein-sodium, 0.6% moisture, and traces of free salicylic acid.—Pharm. Zentral-Ztg., 1913, No. 9.

**Alypin.**—F. Bruck called attention four years ago to the misleading statements in the advertising of alypin. Both an anaesthetic and blood-expelling action are claimed for it, but in reality it has none of the latter. It is also stated that alypin is considerably less toxic than cocaine, while Schröder and others have found that

it is fully as toxic as cocaine and the last supplement to the German Pharmacopœia gives the maximum dose the same for both alypin and cocaine (Therap. Monatsh. Berlin, 1913, v. 27, No. 11).—J. Am. M. Assoc., 1913, v. 61, 2281. (M. I. W.)

**Amylene-Chloral Solution** (50%), **Kalle**, is a 50 per cent. solution by weight of methylbutanon-chloral,  $\text{CCl}_3\text{CH}(\text{OH})\text{OC}(\text{C}_2\text{H}_5)(\text{CH}_3)_2$ , produced by union of chloral,  $\text{CCl}_3\cdot\text{CHO}$ , and 2-methylbutan-2-ol (amylene hydrate),  $\text{CH}_3\text{CH}_2\cdot\text{C}(\text{CH}_3)(\text{OH})\cdot\text{CH}_2$ . Absolute amylene-chloral (methylbutanol-chloral) is a colorless, oily liquid of characteristic camphoraceous odor and cooling, burning taste. Soluble in alcohol, ether, acetone, and fixed oils in all proportions. It is insoluble in water, but on long contact with it goes into solution. On the further addition of water, separation occurs. Specific gravity, 1.24; boiling point,  $-23^\circ\text{C}$ . ( $-9.4^\circ\text{F}$ .) with decomposition.—J. Am. M. Assoc., v. 60, 1881. (M. I. W.)

**Antimalazin** is the name given to the serum of sheep deprived of the ovaries, and is recommended for the treatment of osteomalacia.—Münch. Med. Wschr., 1913, 693.

**Antileutin**, an anti-syphilitic remedy for subcutaneous use, consisting of a 2.5 per cent. solution of the bitartrate of potassium, ammonium and antimony oxide,  $(\text{SbO}(\text{C}_4\text{H}_4\text{O}_6)_2\cdot\text{K}(\text{NH}_4)_2\cdot\text{H}_2\text{O})$ , with or without the addition of cocaine. Dose, 1-2 Cc. D. Med. Wschr., 1913, No. 21.

**Anovarthyreoidin** is a serum obtained, according to Dr. R. Hoffmann, from the blood of thyroid and ovary-ektomated sheep. The serum, which probably combines the active components of the thyroid gland and hypophysis secretions, is recommended in osteomalacia, rachitis and for the treatment of anaphylactic conditions, etc., and may, like antithyroidin, be administered *per os*, as well as subcutaneously in doses of 5 to 10 Cc. with intermissions of three to five days. —Münch. Med. Wschr., 1913, No. 13.

**Apocynamarin-New** (now called "Cymarin," which see) is the active principle of *Apocynum cannabinum* obtained by extracting the drug with suitable solvents, precipitation from its solution with petroleum ether, and purification by recrystallization. It forms colorless prisms having a strong bitter taste and melting at  $140^\circ\text{C}$ . to a clear liquid; difficultly soluble in cold water, somewhat more freely in hot water and in organic solvents. It may be obtained

both from the root and the bark, and is also obtainable from other *Apocynaceae*—*A. androsaemifolium*, *A. senetum*, etc. The "new" apocynamarin may be converted into the apocynamarin heretofore known by boiling with 1 per cent. acetic acid; but the typical action on the heart is exclusively due to the active substance from *Apocynum cannabinum* obtained as above described. The dose is  $\frac{3}{10}$  to 1 Mgm. internally, or  $\frac{1}{2}$  to 1 Mgm. hypodermically.—Pharm. Ztg., lviii (1913), No. 36, 357; from Apoth. Ztg.

**Atophan.**—*Secondary Effects.*—John Philips calls attention to the occurrence of various skin rashes caused by the administration of atophan and reports 5 cases. These rashes resemble those following the administration of antipyrine and indicate that atophan should not be given in the treatment of urticaria as has been advised.—J. Am. M. Assoc., 1913, v. 61, 1040. (M. I. W.)

**Arausan** is the name given to an embrocation, containing 20% camphor, 10% balsam of Peru and 20% potassium soap, which is employed in tuberculosis and catarrhal affections of the respiratory organs.—Pharm. Centralh., 1913, No. 15.

**Argulan** is the name given to dimethyl-phenyl-pyrazolon-mercury, and is claimed to have proven serviceable as an anti-syphilitic.—Med. Klin., 1913, No. 21.

**Arrhenal.**—*Incompatibility with Cherry Laurel Water.*—A solution of

Arrhenal.....	0.5 Gm.
Cherry laurel water.....	10 Gm.

gave a precipitate upon standing twenty-four hours. This can be avoided if the cherry laurel water is diluted about ten times with distilled water, and the dose is consequently increased. Journ. Pharm. d'Anvers., 1913, 124. (O. R.)

**Arheol** is a proprietary name for santalol,  $C_{15}H_{26}OH$ , a sesquiterpenic alcohol, the chief constituent of sandalwood. Arheol is a colorless, oily liquid; specific gravity, 0.979 at 15° C. It is insoluble in water but soluble in alcohol. It boils under 11 Mm. pressure at 169° C., and under ordinary pressure at about 500° C.—J. Am. M. Assoc., 1913, v. 61, 1900. (M. I. W.)

**Artemidol** is the name given to tablets containing an extract of *Artemisia abrotanum*, prepared by a special process, which are exploited for the treatment of affections of the respiratory organs.—Pharm. Zentralh., 1913, No. 13.

**Atophan-Dragees**, each containing 0.1 Gm. of atophan, are exploited as a palatable form for administering this remedy.—Pharm. Zentralh., 1913, No. 18.

**Atropin Sulphuric Acid "Roche,"** not to be confused with atropine sulphate, is represented to be an inner ester of complex constitution, to which the empiric formula  $C_{17}H_{23}O_6NS$  is assigned. It forms colorless, handsome shining, anhydrous prisms, m. p.  $238^{\circ}$ – $239^{\circ}$  C., is insoluble in the organic solvents, difficultly soluble in cold water, readily soluble in hot water, somewhat more soluble in ammonia and in dilute acids than in cold water. It is differentiated from atropine sulphate by its solubilities, by its ready crystallizability, and by other tests of identity which may be consulted in the original. Like atropine, atropin sulphuric acid serves for the suppression of the salivation manifested during the ether-drop narcosis, but it is one-half less poisonous than atropine. A combination of this acid with pantopon, described elsewhere in the alphabetical order as "pantopon-atropin sulphuric acid," is supplied for the purpose of regulating and supporting the ether-drop narcosis.—Pharm. Ztg., lviii (1913), No. 32, 318.

**Bertolin**, described by its exploiters as an absolutely non-toxic plant extract, is claimed to be a promptly active extract of *Bertolletia* and is recommended in cases of arthritis, malaria and arteriosclerosis. According to an examination of C. Mannich and R. C. Schaefer the preparation is a liquid extracted with wine in which they failed to find a substance to which the therapeutic effect claimed is attributable, although very small quantities of alkaloid were detected, too small for identification. Pharm. Ztg., lviii (1913), No. 36, 357; from Apoth. Ztg.

**Bismethylaminotetraminoarsenobenzol Chlorhydrate** is a new arsenic compound, containing 26.5% of As, to which its exploiters assign the formula  $C_{14}H_{24}N_6As_2Cl_4$ . It is recommended as a serviceable remedy against spirocheta, and is permanently preserved, in form of a sulphur-yellow powder, in sealed glass tubes which must be either evacuated or filled with an indifferent gas. Slowly soluble at room temperature in water, forming perfectly clear solutions having an acid reaction. The readily oxidizable base is precipitated from its solutions by sodium or potassium hydroxide, and not redissolved by excess of the precipitant, but is redissolved by alkaline carbonates, in which form it is employed therapeutically.

Pharm. Ztg., lviii (1913), No. 57, 563; from Münch. Med. Wschr., 1913, No. 20.



**Bismolan Suppositories**, exploited for the treatment of haemorrhoids, have been analyzed by Dr. Jüngerich with the following results: Bismuth oxychloride, 0.1 Gm.; zinc oxide, 0.15 Gm.; suprenen solution (1:1000), 0.005; eucaine hydrochlor., 0.05 Gm.; lanolin, 0.5 Gm.; solid vaselin, q. s. ad. 2.0 Gm.—Pharm. Ztg., lviii (1913), No. 89, 894; from D. Med. Wschr., 1913, No. 44.

**Blenotin**, a urinary antiseptic in capsules, is now supplied in two forms, the one designated as "brown," the other as "green," which differ very slightly in their respective compositions. They both contain practically the same quantities of sandalwood oil, myrrh, hexamethylenetetramine and champignon extract; but Blenotin "brown" contains a little camphor and boric acid, while Blenotin "green" contains a small quantity of benzoic acid instead—this being intended for persons having a sensitive stomach.—Pharm. Ztg., lviii (1913), No. 67, 669.

**Calox**.—The claims made for calox are misleading if not actually false. Calcium dioxide is practically insoluble in water and it is only that fraction which dissolves in water that gives up available oxygen. From the fact that the name "Calox" suggests "calcium dioxide," it is evident that calox belongs in that class of nostrums the composition of which is changed from time to time while the name remains the same. J. Am. M. Assoc., 1913, v. 61, 978-979. (M. I. W.)

**Cellon Ointments** are alcoholic solutions of a new cellulose derivative, presumably acetyl-cellulose, which have a semi-solid consistence, and are supplied in various medicinal combinations. When applied by inunction, the salve disappears and the medicament is absorbed by the skin. Pharm. Ztg., lviii (1913), No. 87, 874.

**Cholosan** is the name given to a gallstone remedy prepared from black radishes, and containing a little alcohol as a preservative. It is administered in doses of a "liquor" glassful three or four times a day, reduced gradually to two doses and finally (after about six weeks) to one dose per day.—Pharm. Ztg., lviii (1913), No. 89, 894.

**Citostypan Tablets** are a specialty containing hydrochloride of cotarnine and hydrastinine.—Pharm. Zentrall., 1913, No. 17.

**Citrospirinum Compositum** has been analyzed by C. Mannich and L. Schwedes who found each pastille to contain approximately

0.42 Gm. acetylsalicylic acid, 0.01 Gm. caffeine, and 0.005 Gm. morphine hydrochloride.—Pharm. Ztg., lviii (1913), No. 75, 751.

**Citrospirinum Compositum** are tablets containing in addition to 0.5 Gm. of citrospirin (a mixture of acetylsalicylic acid and caffeine citrate), 0.005 Gm. of morphine hydrochloride. The remedy is recommended in doses of one or two tablets in ischias, nerve affections, rheumatism, migraine, etc.—Pharm. Ztg., lviii (1913), No. 19, 191.

**Coeliacin Tablets**, exploited for the treatment of sclerodermatic affections, are prepared from the mesenteric gland substance, each tablet containing 0.3 Gm. of the dried gland. The dose is one tablet 3 times daily.—Pharm. Ztg., lviii (1913), No. 7, 66; from Münch. Med. Wschr., 1913, No. 1.

**Collargol**.—*Properties*.—Dr. v. Hoessle gives a corrected statement of the properties of collargol as prepared by von Heyden. It is completely soluble in water. Upon freezing a collargol solution and upon thawing, no separation of silver takes place, but upon prolonging boiling, the silver is formed. Solutions of collargol are not precipitated by alkalies, but precipitates are formed by acids, which are redissolved by alkalies. Saturated solutions of sodium chloride precipitate solutions of collargol, the precipitate again dissolving upon the addition of water. Physiological salt solutions do not precipitate collargol. The precipitate produced by calcium chloride will not again be dissolved by water or alkalies.—Ph. Zhalle., 1913, No. 40. (O. R.)

**Contra-Tussin** is the name given to tablets, each containing 0.1 Gm. aristochin, 0.0005 Gm. dionin, 0.001 Gm. extract belladonna, with sugar and aromatics.—Pharm. Zentralh., 1913, No. 20.

**Cordalen** is the name given to a new digitoxin preparation which is described as being "digitoxinum verum puriss. cryst. solutum," containing 0.3 Mgm. of active substance in 1 Cc. It is administered subcutaneously. Pharm. Ztg., lviii (1913), No. 87, 874; from D. Med. Wschr., 1913, No. 40.

**Creme de Lama**.—*Acidum Boricum*, 40 Gm.; *Oleum Amygdaloar. dulc.*, 25 Gm.; *Paraffin liquid*, 75 Gm.; *Adeps lanae*, 400 Gm.; *Vaselinum album*, 80 Gm.; *Oleum odoratum eth.*, 7.5 Gm.; *Alcannin* Q. S.—Farm. Notisbl., 1913, No. 6. (O. R.)

**Cresepton Pearson** is a new product resembling "Creolin Pearson."—Pharm. Ztg., lviii (1913), No. 64, 631.

**Cymar**in is the name of a new heart remedy, which is described as a crystalline product obtained from fluidextract of *Apocynum cannabinum*. Its action is claimed to be similar to that of digitalis; but, while not so strong in its action on the heart, it is tolerated better and permits of more accurate dosage. It also has a decided effect upon the functions of the kidneys.—Pharm. Ztg., lviii (1913), No. 26, 258.

**Cyprin** is the name given to a palliative remedy for whooping cough prepared from cypress oil, which is used as a spray three or four times daily, and if necessary once or twice at night, on the bed, pillows, and body linen of the patient, who, during the paroxysms, should inhale the remedy from a handkerchief profusely saturated with it. Pharm. Ztg., lviii (1913), No. 67, 669; from Apoth. Ztg., xxviii (1913).

**Despyrin**, a new headache specialty, which is stated by its exploiters to be a definite chemical compound (tartarylsalicylic acid), has been examined by C. Mannich and G. Leemhuis, who find it to be simply a mixture composed of 86 per cent. acetylsalicylic acid and 14 per cent. potassium bitartrate. The remedy is supplied in form of capsules.—Pharm. Ztg., lviii (1913), No. 75, 751.

**Diablastin** is a new remedy exploited for the treatment of cancerous affections. It is stated to be composed of salts of formic acid and the fluidextract of a Papaveracea. The remedy is given in doses of a teaspoonful four times daily in milk and is claimed to exert infallibly a favorable influence on the carcinoma.—Pharm. Ztg., lviii (1913), No. 9, 88; from Allgem. Med. Central-Ztg., 1913, No. 4.

**Digacoffein "Lelluc"** is a specialty supplied in form of ampuls, each containing 1 Cc. of digalen and 0.07 Gm. caffeine citrate.—Pharm. Zentralh., 1913, No. 16.

**Digimorval** is the name give to 1 Gm. tablets, each containing 0.005 Gm. morphine, 0.05 Gm. powdered digitalis, and 3 drops of menthol-valerate (?), which are recommended for the treatment of ailments affecting the circulation, and more particularly those affecting the heart's action. The dose is 1 to 4 tablets 2 or 3 times daily.—Pharm. Ztg., lviii (1913), No. 52, 512.

**Digipan Dr. Haas** is a digitalin preparation, obtained by a cold process, containing the active glucosides of digitalis leaves and physiologically standardized against the digitalis leaves A of the

Imperial Health Bureau (Austrian?). It is supplied in liquid and tablet form and administered internally or subcutaneously, intramuscular, intravenous, and rectal. *-Südd. Ap. Ztg.*, 1913, No. 43.

**Digipan** is described by its manufacturers as containing digitoxin and digitalin, the active glucosides of digitalis leaves, approximately in the proportions in which they exist in the plant, while the irritant constituent of the leaves, digitonin, is completely excluded. Digipan occurs in form of a white, amorphous mass, which is readily soluble in chloroform, in ethyl alcohol, and in methyl alcohol, in all proportions, forming clear solutions. In isotonic nutrient saline solution it is soluble in the proportion of 1 : 700; but in ether, acetone, petroleum benzin, and the chlor-derivatives of ethylene, and ethane, it is insoluble. *-Pharm. Ztg.*, lviii (1913), No. 94, 940.

**Digipoten** consists of the digitalis glucosides in soluble form, diluted with milk sugar to give the preparation an activity approximately equal to that of digitalis of good quality. Digipoten is standardized by the "one-hour frog" and the guinea-pig methods, and is adjusted to an activity of approximately 1,400 heart tonic units (of Houghton). It contains from 0.3 to 0.4 per cent. of digitoxin as determined by a modified Fromme method. *J. Am. M. Assoc.*, v. 61, 2069.

**Diogenal**, a new bromine derivative of veronal, is described as being "dibrompropyldiethylbarbituric acid," a fine, white crystalline powder, having a feebly bitter taste, almost insoluble in water, and resistant to acids, therefore insoluble in the stomach, but gradually soluble in the alkaline intestinal fluids. When heated with diluted alkali or when boiled with water, hydrobromic acid is gradually split off. Diogenal melts at about 126° C. and contains 41.6% of bromine. It is introduced as a substitute for veronal in insomnia, over which it possesses the advantage of inferior toxicity.

*Pharm. Ztg.*, lviii (1913), No. 96, 960; from *Münch. Med. Wschr.*, 1913, No. 47.

**Dionin in Cataract.**—The use of dionin in the early stage of senile cataracts of the ordinary type dates from its first introduction by Wolfberg, under the name "peronin," which he described in the third volume (1889) of the *Wochenschrift für Therapie des Auges*. Later, when Merck introduced ethylmorphine hydrochloride under the trade name of dionin, displacing the benzylmorphine hydrochloride, or peronin, Wolfberg and



others experimented with the new remedy in almost every disease to which the human eye is heir.—J. Am. M. Assoc., v. 60, 69.

**Diplosal** is the salicylic ester of salicylic acid,  $\text{OH.C}_6\text{H}_4\text{COO.C}_6\text{H}_4\text{COOH}$ . It is obtained from salicylic acid or salicylates by the action of suitable condensing agents. It occurs as a white, crystalline powder, practically free from odor and taste. It melts at  $147^\circ$ – $148^\circ$  C. It is almost insoluble in water, but is easily soluble in ether and in benzene. It is soluble in alkaline solutions, with formation of alkali salicylate.—J. Am. M. Assoc., 1913, v. 61, 121. (M. I. W.)

**Diplosal, its Toxicity.**—John MacLachlan says diplosal, or salicylo-salicylic acid ( $\text{OH.C}_6\text{H}_4\text{COO.C}_6\text{H}_4\text{COOH}$ ), is a compound obtained by the condensation of two molecules of salicylic acid, a phenol group of one molecule reacting with the hydroxyl group of the other molecule with elimination of water thus forming the salicylic ester of salicylic acid. When decomposed by hydrolysis it takes up water, and 100 parts of diplosal yield 107 parts of the salicylic acid. This drug, if given in the same manner as the other salicylates, produces the same symptoms of toxicity and with equal severity. A table is appended showing a comparison of effects of diplosal, sodium salicylate and oil of gaultheria.—J. Am. M. Assoc., 1913, v. 61, 116–117. (M. I. W.)

**Dioxyanthrachinon**, a new purgative, is obtained by melting 1,8-anthrachinondisulphonic acid with lime. It forms gold to orange-yellow, shining scales (or an orange-yellow powder), melting at  $190^\circ$  to  $192^\circ$  C., is difficultly soluble in water and in the ordinary organic solvents, but soluble in about 10 parts of hot glacial acetic acid. It is sparingly soluble also in alkalis and precipitated from its cherry-red solution by acids, forming a yellow precipitate of free 1,8-dioxyanthrachinon, which may be sublimed by careful heating. The new preparation is closely related to emodin, and is given in doses of 0.15 0.1 0.45 Gm., 0.3 Gm. on the average sufficing.—Pharm. Ztg., lviii (1913), No. 36, 357; from Apoth. Ztg.

**Doriform** is said to be a compound of bismuth oxide and tetrapyrrocatechin and to have an activity similar to that of iodoform. It is a yellow, perfectly odorless, insoluble powder, sterilizable, innocuous, and non-irritant, and is used in form of 5 to 10% ointments, in admixture with phenol and salicylic acid, as also in form of dusting powder with zinc oxide, borax, starch, etc., for the treatment of skin diseases.—Pharm. Ztg., lviii (1913), No. 91, 912.

**Dreiaform** is a formaldehyde-aluminum silicate, uniting the activity of its three components. It is supplied in the form of a fine white powder, having a faint formaldehyde odor and is recommended as a protective against new infection by dusting the powder on the sterilized edges of wounds during the healing process.—Pharm. Zentralh., 1913, No. 16.

**Echinacea** was considered by the Council on Pharmacy and Chemistry, and was rejected on the ground of insufficient evidence for its therapeutic efficiency. So far as can be learned, no reliable evidence for the claims made for the drug has been presented since this report was made by the Council.—J. Am. M. Assoc., v. 60, 69. (M. I. W.)

**Echinacea.**—Echinacea has been claimed to be a "specific" for rattlesnake bite, syphilis, typhoid fever, malaria, diphtheria and hydrophobia. Later enthusiasts have credited it with equally certain curative effects in tuberculosis, tetanus and exophthalmic goiter, and with power of retarding the development of cancer. On the basis of the available evidence the Council on Pharmacy and Chemistry decided that echinacea was not worthy of recognition as a drug of probable value. Accordingly it voted not to describe the drug in New and Nonofficial Remedies (The Journal, November 27, 1909, 1836). So far as can be learned no reliable evidence for the claims made for this drug has been presented since the Council decided that the available evidence did not entitle it to a place in New and Nonofficial Remedies.—J. Am. M. Assoc., v. 61, 2089. (M. I. W.)

**Efucsa** (*Tabletæ Extr. Fuci vesiculos. Comp.*) is the name given to tablets containing, among other constituents, extract of bladder wrack, which are exploited for the treatment of obesity and attending conditions.—Pharm. Ztg., lviii (1913), No. 55, 544.

**Eisen (Iron)-Bromocitrin** is a specialty in form of tablets, each containing 0.006 Gm. bromine, 0.0015 Gm. iron, and 0.0425 Gm. lecithin, which are recommended for the treatment of neurasthenia, hysteria, epilepsy, etc. *Eisen-Bromocitrin cum Arsen.* are the same with the addition of 0.0002 Gm. of arsenous acid.—Pharm. Ztg., lviii (1913), No. 36, 356.

**Eisenphytin "Ciba"** is a neutral iron salt of phytinic acid (inositolphosphoric acid) in colloidal form, containing about  $7\frac{1}{2}\%$  Fe and 6% P. The Eisenphytin is in organic combination, but

requires concentrated hydrochloric acid for its decomposition. The iron content is insoluble in water and in diluted hydrochloric acid, while by the action of dilute soda solution eisenphytin forms a brown-red solution. The preparation, which is supplied in form of pills and as granular powder, combines the roborant effect of phytin with the specific effect of iron.—Pharm. Ztg., lviii (1913), No. 98, 979.

**Elarson** is a new arsenic preparation, represented as being the strontium salt of a peculiar compound of chlorine and arsenic with behenic acid, a highly molecular fatty acid. It is a nearly colorless, amorphous, tasteless powder, absolutely insoluble in water, and only very sparingly soluble in alcohol, ether and olive oil. When strongly heated it is decomposed with frothing and blackening, volatilization of organic substances and elementary arsenic resulting. Elarson contains on the average about 13% of arsenic and about 6% of chlorine. It has no detrimental action upon the mucous membrane of the stomach, but exerts its arsenical effect when it reaches the intestines through which it enters the circulation. According to clinical experiments this new arsenic preparation is particularly adapted for the treatment of anæmia, chlorosis, chorea, Basedow's sickness, etc., and is distinguished by being well tolerated in cases of tuberculosis and phthisis. Elarson is supplied in form of tablets, each containing 0.0005 Gm. of arsenic, thus corresponding to about 1 drop of Fowler's solution.—Pharm. Ztg., lviii (1913), No. 2, 15.

**Electromercurol** is a colloidal suspension of mercury equivalent to 0.1 per cent. metallic mercury (Hg) and containing a small percentage of sodium arabate. Electr-Hg is an odorless, tasteless liquid appearing transparent and brown in color by transmitted light and opaque and gray by reflected light. The addition of potassium cyanide solution or of strong nitric acid yields clear, colorless solutions. The nitric acid solution responds to tests for mercury.—J. Am. M. Assoc., 1913, v. 61, 868.

**Emulsio Angier** is a specialty recommended as a palliative in irritant catarrhal affections, which is prepared from a specially purified petroleum product, and containing also sodium benzoate, calcium hypophosphite, sodium hypophosphite, glycerin, acacia and water. The emulsion is described as being a yellowish white, viscous, cream-like liquid, absolutely odorless and having an agreeable taste. It contains 34.7 parts of the petroleum oil in 100, and is readily miscible with water, but may be administered

undiluted.—Pharm. Ztg., lviii (1913), No. 70, 697; from *Aerztliche Rundschau*, 1913, No. 34.

**Enteroseptyl** is the name given trinaphthyl phosphate, which is exploited as an internal antiseptic remedy.—Pharm. Ztg., lviii (1913), No. 31, 311; Pharm. Zentralh., 1913, No. 15.

**Enzytol (Borcholin)** is the name given to a loose combination of boron and cholin, which splits off cholin in the organism and acts analogous to the therapeutically active rays. It is recommended as a bactericidal remedy in the treatment of tuberculosis, and is supplied in form of a 10% solution. The dose is 0.01 to 0.25 Gm., which is best administered by intravenous injection.—Münch. Med. Wschr., 1913, No. 14.

**Erysol** is the name given to a mixture of phenol and camphor. It is a colorless, oily fluid, non-caustic, having a camphor odor, but free from phenol odor. Erysol is claimed to be serviceable as an antistreptococci remedy in surgical ailments as well as in erysipelas.—Pharm. Ztg., lviii (1913), No. 64, 631; from *Therap. Monatsh.*, 1913, No. 8.

**Eubalsol** is the name given to two liquid preparations recommended for gonorrhœa, the one for external use, the other for internal administration. According to analyses made by C. Mannich and G. Leemhuis, the preparation for external use consists of a solution of about 2.0 Gm. of the zinc salt of an organic sulpho acid (*Zincum sulpho carbolicum*), 3.0 Gm. boric acid and 0.6 Gm. sodium salicylate in 83.0 Gm. water and 11.0 Gm. glycerin. The second preparation apparently contains 2 per cent. of sandal oil, a few per cent. of copaiba and 30 per cent. of fixed oil, which are imperfectly emulsioned with the aid of gum or dextrin in a medium consisting of sugar solution and some glycerin.—Pharm. Ztg., lviii (1913), No. 57, 563.

**Eucerin-Lead Ointment**, which has recently been distributed among physicians as an example of the value of the new ointment base, eucerin, for incorporation of large quantities of aqueous solution, may, according to its manufacturers, be prepared by the following formula: *Liq. Plumbi subacet.*, 10.0; *Aqua destill.*, 40.0; *Eucerinum anhydric*, 50.0. The lead subacetate solution is mixed with the water and gradually incorporated with the ointment base. A perfectly homogeneous and stable preparation is thus obtained, which does not separate on prolonged standing.—Pharm. Ztg., lviii (1913), No. 73, 739.



**Eumecon**, a proprietary specialty recommended for morphinismus, has been analyzed by C. Mannich and G. Leemhuis, who find it to contain, beside 0.6% of sodium salicylate, 1.5% of *morphine hydrochloride*. Neither extract of maté nor extract of cinchona, which are mentioned as constituents by its exploiters, could be detected in this preparation.—Pharm. Ztg., lviii (1913), No. 57, 563.

**Eusitin** is the name given to anti-fat tablets which are claimed by the exploiters to consist of the mucilaginous components of *Althæa ros. syriens*, a plant used for this and similar purposes by the Syrian Arabs. One tablet is to be taken after each meal, and if necessary between meals to allay hunger.—Pharm. Ztg., lviii (1913), No. 89, 894; from Fortschr. d. Med., 1913, No. 35.

**Euthalatlin** is the name given to a new remedy for preventing sea-sickness, in form of capsules containing medicaments that increase blood pressure and expand the cerebral vessels. Such are caffeine, theobrominesodiumsalicylate and camphor. The euthalatlin capsules contain these substances, which are given under accompanying directions 2 or 3 hours before a sea or railroad journey. The package also contains tablets composed of bromine and sodium diethylbarbiturate to produce sleep.—Pharm. Ztg., lviii (1913), No. 71, 709.

**Expulsin** is the name given to a preparation recommended for local application in gout, rheumatism, podagra, ischias and articular pain, for which great efficacy is claimed. According to C. Mannich and R. C. Schaefer, the new specialty consists of about 60 per cent. of impure clay and about 40 per cent. of impure calcium and magnesium phosphates.—Pharm. Ztg., lviii (1913), No. 36, 357; from Apoth. Ztg.

**Extractum Valerianæ Aromaticum "Kern"** is described as a highly concentrated (1 : 5) extract of valerian, faintly sweetened, aromatized, and containing only from 6 to 8 per cent. of alcohol. Its specific gravity is 1.08-1.1.—D. Med. Wschr., 1913, No. 24.

**Festalkol** is the name of a hand-disinfection preparation for midwives, containing soap prepared from the purest palmitic and stearic acids and formed into a paste-like mass with 80 to 98 per cent. alcohol. It is supplied in cylindrical glass containers, each containing 20 Gm. divided into three portions, which is sufficient for each hand disinfection when applied by inunction according

to specific directions accompanying each package.—Pharm. Ztg., lviii (1913), No. 87, 874; from D. Med. Wschr., 1913, No. 43.

**Folliculin** is the name given to an aqueous fluidextract prepared by slowly percolating Tinnevelly senna leaflets with cold distilled water after having previously macerated them for 8 or 10 hours. The percolation is continued until the percolate passes colorless, and the total percolate is then reduced by evaporation on a steam bath or *in vacuo* to the original weight of the drug used. After adding 0.05 per cent. of saccharin, the fluidextract is divided in flasks of 100–200 Gm. and is then sterilized. Dose, 1–3 teaspoonfuls per day. Pharm. Ztg., lviii (1913), No. 7, 66; from Therap. d. Gegenw., 1913, No. 1.

**Fulmargin** is the name given to a colloidal silver preparation obtained by an electrical method of disintegration, which is distinguished from colloidal silver obtained by chemical methods, among other advantages, by a more subtle degree of division. It is supplied in ampuls ready for use.—Pharm. Ztg., lviii (1913), No. 64, 631.

**Gallisan** is the protected name for a combination of “ovogall” (bile combined with albumen) with other active stomachics that have proven efficacious in liver and gall complaints. The remedy is supplied in 0.25 Gm. tablets.—Pharm. Ztg., lviii (1913), No. 49, 484.

**Gelonida Stomachica Fortiora** are gelatins containing *pro dosi* 0.001 extract of belladonna, 0.1 bismuth nitrate and 0.15 calcined magnesias.—Pharm. Zentralh., 1913, No. 18.

**Girheubin** is the name of a rheumatism remedy which is said to be composed of various vegetable remedies that have been successfully employed in the olden time, including plants of the *Betulaceæ*, the *Hamamelidaceæ*, *Castanææ*, etc., with cacao as corrigent.—Pharm. Ztg., lviii (1913), No. 45, 447.

**Glanduovin** is the name given to an extract of ovaries, freed from albumen, which is supplied in form of a clear, light yellow fluid, enclosed and sterilized in ampuls, and claimed to possess permanent stability in this form—1.1 Cc. representing 1.0 Gm. of the ovarian tissues.—Pharm. Ztg., lviii (1913), No. 83, 830.

**Glycobrom** is the name given to a new organic bromine compound, which proves to be the glyceride of brominated cinnamic

acid. It is supplied in form of a white, amorphous, completely tasteless powder, melting at  $66^{\circ}$ – $68^{\circ}$  C. and containing 50 per cent. of bromine; insoluble in water, sparingly soluble in alcohol, but readily soluble in ether and in chloroform. Recommended in cases in which slow and graduated absorption of bromine by the organism is desired.—Pharm. Ztg., lviii (1913), No. 64, 631; from Therap. Monatsh., 1913, No. 8.

**Guamaltin** is the name of a malt extract combined with potassium sulphoguaiacolate.—Pharm. Ztg., lviii (1913), No. 87, 874.

**Gynesan** is the name given to a saline nutrient preparation, exploited for the use of pregnant and nursing women, as well as for a general mineral nutrient. It occurs as a fine yellowish powder and is said to contain the mineral constituents of 1 liter of human milk in a teaspoonful, lacking only magnesium as antagonist of calcium. The composition of a teaspoonful of the powder is stated to be as follows:  $0.4 \text{ K}_2\text{O}$ ,  $0.01 \text{ Na}_2\text{O}$ ,  $0.6 \text{ P}_2\text{O}_5$ ,  $0.4 \text{ CaO}$ ,  $0.015 \text{ Fe}_2\text{O}_3$ ,  $0.0003 \text{ Fe}$ ,  $0.006 \text{ Cl}$  and  $0.001$  citric acid.—Allgem. Med. Central-Ztg., 1913, No. 16.

**Gyraldose** is the name given to a vaginal disinfectant consisting of a mixture of thymol and trioxymethylene with aluminum sulphate. It is recommended in form of solutions made in the proportion of a tablespoonful to 1 liter of luke-warm water.—Pharm. Ztg., lviii (1913), No. 87, 874; from Gaz. médec. de Paris, 1913.

**Hediosit** is the lactone or inner anhydride  $\text{C}_{17}\text{H}_{12}\text{N}_7$  of alpha-glucosheptonic acid,  $\text{CH}_2\text{OH}(\text{CHOH})_5\text{COOH}$ . It is prepared by treating glucose with hydrocyanic acid, the condensation product being treated with barium hydroxide and the lactone of alpha-glucosheptonic acid liberated by the addition of sulphuric acid. This solution is evaporated and the product is then recrystallized. Hediosit is a white, crystalline, odorless powder, possessing a sweet taste. It is readily soluble in water, slightly soluble in alcohol and almost insoluble in ether. The aqueous solution is acid toward litmus.—J. Am. M. Assoc., v. 60, 516. (M. I. W.)

**Hygralon** is the name given to a mercury potassium soap prepared from coconut oil, which is intended for stainless injections, and is claimed to contain 30 per cent. of metallic mercury. It is supplied in graduated glass tubes to facilitate accurate dosage.—Pharm. Ztg., lviii (1913), No. 45, 447.

**Hypamin "Aubing"** is the name given to a parturition-inciting sterile and stable extract prepared from the infundibular portion of the hypophyse, 1 Cc. representing 0.15 Gm. of the fresh infundibular substance. It is supplied in ampuls, containing 1.1, 2.6, and 10.0 Cc. of the extract, and is intended mainly for veterinary use.—Pharm. Ztg., lviii (1913), No. 94, 940.

**Hyperol** is the name given to a solid form of hydrogen dioxide, and proves on analyses to be a compound of urea and  $\text{H}_2\text{O}_2$ , to which a small quantity of an organic acid has been added. Apparently this compound is identical with the substance described by Tanatar in 1908, which has the formula  $\text{NH}_2\text{CO.NH}_2.\text{H}_2\text{O}_2$ , and contains theoretically 36.1% of hydrogen dioxide.—Pharm. Ztg., lviii (1913), No. 3, 26.

**Hypophysin** is the name given to a new basic substance which in the form of a sulphate is claimed to be the active principle of the hypophyse, and is said to be obtained from the glandular extract freed from albuminoid bodies, by means of alkaloidal precipitants, such as phosphotungstic acid. The precipitate obtained is decomposed with baryta, the excess of baryta removed with sulphuric acid, and the solution of alkaloidal sulphate evaporated to crystallization *in vacuo*. The saline compound so obtained consists of well-formed crystals of a faint yellow color and slight acid reaction, which are soluble in water, but difficultly soluble in alcohol, acetone, acetic ether, etc., and possess optical activity (levorotatory) in aqueous solution. Although "hypophysin" is uniformly obtainable of identical composition, it is not a single body, but a mixture of four different well-defined bodies, which possess the activity of the hypophyse in a quantitatively different degree; but reciprocally increasing the therapeutic potency of each other, the pharmacological use of the individual bodies by themselves is not advisable, the combined activity on the uterus, blood pressure and respiration being identical with that of the hypophyse extract itself. The remedy is supplied in 1 pro mille solution, 1 Cc. of which corresponds to 0.2 Gm. of the fresh gland. —Pharm. Ztg., lviii (1913), No. 23, 229.

**Igbusan** is the name given to a new skin cream adapted particularly to wounded surfaces in children, which is supplied in form of tubes. It is composed of a lanolin base, forming an emollient, white, agreeably perfumed ointment.—Pharm. Ztg., lviii (1913), No. 19, 191.

**Igebin** is the name given to a new antipyretic and antineuralgic,



stated to consist essentially of dimethylaminophenyldimethylpyrazolon, together with small quantities of cinchona alkaloids and the active principle of cola nuts.—Pharm. Ztg., lviii (1913), No 19, 191.

**Intestifermin** is the name given to a mixture of pure cultures of glyco bacterium and yoghurt bacterium, which is exploited for the preparation of alcohol-free lemonades or other agreeable beverages in the tropics.—Südd. Ap. Ztg., 1913, No. 45.

**Iodoïn Tablets** are intended for the convenient and rapid preparation of iodine solutions in accurate dosage. They consist of two tablets of different composition, the one containing sodium iodide and sodium nitrite, the other tartaric acid. These contents are so adjusted that when the simultaneously prepared solutions of the two tablets in the prescribed quantity of water are mixed, the acid solution reacting with the sodium nitrite liberates the nitrous acid, which in turn reacts with the sodium iodide and liberates sufficient iodine to make about 0.5 Gm. (accurately, 0.485), leaving a small amount of undecomposed sodium iodide to retain the liberated iodine in solution.—Pharm. Ztg., lviii (1913), No. 96, 960; from Münch. Med. Wschr., 1913, No. 47.

**Iodtriferrin** (Iodparanucleinate of Iron) contains 15 per cent. of iron, 8.5 per cent. of iodine, and 2.2 per cent. of phosphorus. It is a reddish brown powder having a faint metallic taste and a faint odor reminding of iodine; nearly insoluble in water and diluted acids, but readily soluble in dilute alkali and in concentrated acid, from which solutions it is precipitated unchanged by acids or alkalies, respectively. Iodtriferrin is recommended in anæmia, scrofula, etc., in doses of 0.2 Gm., either in powder or in tablets, 3 times daily.—Pharm. Ztg., lviii (1913), No. 55, 544.

**Istizin** is the protected name for "dioxyanthrachinon" which is mentioned in the alphabetical order on a preceding page. The new purgative is supplied in form of tablets, each containing 0.3 Gm. of the medicament.

**Isatophan** is methoxy-atophan, 8-methoxy-2-phenylquinolin-4-carboxylic acid,  $\text{CH}_2\text{O} \cdot \text{C}_7\text{H}_4\text{N} \cdot \text{C}_6\text{H}_5 \cdot \text{COOH}$ . S : 2 : 4. 8-methoxy-2-phenylquinolin-4-carboxylic acid was described by Doebner (Annalen der Chemie, Liebig, Vol. 249, 107), who prepared it by warming together pyrroacemic acid, benzaldehyde and ortho-anisidin in alcohol. Isatophan is a lemon-yellow crystalline powder

melting at  $216^{\circ}$  C., soluble in alcohol and alkalies but insoluble in water or ether. It is tasteless and possesses a slight odor resembling atophan.—*J. Am. M. Assoc.*, v. 60, 516. (M. I. W.)

**"Jolu" Franzbranntwein** ("Jolu" brandy) is described as a preparation containing the natural salts of the Wiesbaden thermal spring, and is recommended by its exploiters as an embrocation in gout and rheumatism and also as an addition to baths and fomentations.—*Pharm. Ztg.*, lviii (1913), No. 36, 356.

**Jecurbilis** is the name given to a specialty exploited for the treatment of gall and liver affections, which is composed according to C. Mannich and L. Schwedes of a hydro-alcoholic extract of drugs containing emodin.—*Pharm. Ztg.*, lviii (1913), No. 27, 268.

**Katapyrin** is the name given to tablets composed of dimethylaminophenazone (chemically identical with "pyramidon") and acetylacetic acid, which are recommended by its exploiters as an efficient anti-neuralgic and anti-pyretic in catanic ague as the first resort.—*Pharm. Ztg.*, lviii (1913), No. 64, 631.

**Kephaldol Tablets**, which in contradiction to the exploiters statement that they represent a definite chemical compound have been pronounced by Zernik to be a mixture containing free phenacetin, have been reexamined by C. Mannich and R. C. Schaefer, who now confirm Zernik's findings. They find that kephaldol tablets contain in round figures 50 per cent. of free phenacetin, together with salicylic acid, quinine and citric acid—the acids being in part combined with sodium.—*Pharm. Ztg.*, lviii (1913), No. 36, 357; from *Apoth. Ztg.*

**Kephalidon** is according to the investigations of O. Anselmino a complex combination of aminoacetphenetidin, caffeine and hydrobromic acid, with dimethylaminophenyldimethylpyrazolon.—*Pharm. Ztg.*, lviii (1913), No. 27, 268.

**Lactopeptine**.—W. A. Puckner submits a report on the re-examination of lactopeptine, which confirms the findings of the Council on Pharmacy and Chemistry published some six years ago.—*J. Am. Med. Assoc.*, 1913, v. 61, 358-359. (M. I. W.)

**Landopan Dr. Haas** is the name given to a mixture of the principal therapeutically active alkaloids of opium in form of meconates, which is used both internally and subcutaneously as analgesic, hypnotic, narcotic and sedative, and is supplied in form

of 2 per cent. solution in ampuls and in form of tablets. —Sudd. Ap. Ztg., 1913, No. 43.

**Larosan** is the name given to "casein-calcium," which is supplied in the form of a loose, fine, tasteless powder, insoluble in water. Added to milk in the proportion of 2 : 100, it is recommended as a substitute for albumen-milk. —Munch. Med. Wschr., 1913, No. 6.

**Leptynol** is the name given to an anti-fat remedy which is used subcutaneously, and represents a colloidal solution of wool-fat-palladiumhydroxydul in liquid paraffin, containing about 25 Mgm. of palladium per Cc. The preparation, being a somewhat thick liquid, is warmed slightly before administration—about 2 Cc. being injected deeply into the abdominal fat. —Pharm. Ztg., lviii (1913), No. 23, 229; from Munch. Med. Wschr., 1913, No. 10.

**Leukozone** is the name given to calcium perborate of high percentage, prepared by a protected process, which is adjusted with approximately an equal quantity of tale to a content of 5 per cent. active oxygen. This product is used either by itself or suitably diluted as a dusting powder. —Pharm. Ztg., lviii (1913), No. 86, 861.

**Liposol** is a mercurial oil, prepared under a patent, containing 0.8 per cent. of metallic mercury in colloidal form. —Pharm. Ztg., lviii (1913), No. 7, 66.

**Luminal** is a white, odorless, slightly bitter powder. It is almost insoluble in cold water, slightly soluble in hot water and readily soluble in alcohol, ether and chloroform, and in alkaline solutions. It crystallizes from boiling water in lustrous leaflets, and is precipitated unchanged by acids from its alkaline solution. It melts at 170°–172° C. If about 0.3 Gm. of luminal be shaken for a short time with 1 Cc. of normal sodium hydroxide and 5 Cc. of water, and the mixture filtered, the filtrate will yield white precipitates on the addition of mercuric chloride and of silver nitrate solutions. —J. Am. M. Assoc., v. 60, 1541. (M. I. W.)

**Luminal Sodium** is a white, crystalline, hygroscopic powder, readily soluble in water. On long standing or prolonged boiling of the aqueous solution one molecule of carbon dioxide is liberated and phenylethyl-acetyl-urea is precipitated. Its aqueous solution

is alkaline to litmus. If luminal sodium be incinerated the residue should respond to tests for sodium.—*J. Am. M. Assoc.*, v. 60, 1541. (M. I. W.)

**Lycopuder** is the name given to a substitute for lycopodium which, although designed in particular for lubricating molds for metallic castings, is probably serviceable as a dusting powder. According to O. Anselmino and E. Gilg, lycopuder resembles lycopodium, but is composed principally of starch and a resin, presumably shellac or shellac and ordinary rosin, and is colored with some unstable azo-coloring matter.—*Pharm. Ztg.*, lviii (1913), No. 67, 669; from *Apoth. Ztg.*, xxviii (1913).

**Magalia Ointment** is a specialty which is said to be composed of coconut fat, poppy oil, yellow wax, paraffin, rosin, boric acid and potassium carbonate, together with clove, cajaput, eucalyptus and sandal oil, menthol and chlorophyll.—*Pharm. Ztg.*, lviii (1913), No. 21, 210.

**Maltzym-Nutrient Sugar** is a product of pure wheat starch obtained by the action of the malt ferment (diastase). Besides maltose and malto-dextrin, the preparation contains 1 per cent. of physiologically important salts.—*Pharm. Ztg.*, lviii (1913), No. 89, 894.

**Melubrin** is described as sodium 1-phenyl-2,3-dimethyl-5-pyrazolon-4-amido-methan-sulphonate, the sodium salt of 1-phenyl-2,3-dimethyl-5-pyrazolon-4-amido-methan-sulphonic acid, differing from antipyrine,  $C_{11}H_{12}N_2O$ , in that a sodium-amido-methan-sulphonate group,  $NH.CH_2.SO_3Na$ , has replaced a hydrogen atom of the pyrazolon group. It is a white, odorless, almost tasteless crystalline powder, readily soluble in water, but slightly soluble in alcohol. The aqueous solution is neutral in reaction but unstable.—*J. Am. M. Assoc.*, 1913, v. 61, 869. (M. I. W.)

**Menthospirin** is the name given to acetylsalicylic acid and menthol ester, a pale yellow mass of thick liquid consistence. It is supplied in form of gelatin pearls, each containing 0.25 Gm., and is claimed to give good results in the treatment of acute and sub-acute catarrhs in doses of 2 to 3 pearls two or three times daily.

**Merlusan** is the name given to a new mercury albumen compound which is exploited as a syphilis remedy for internal use. This compound being insoluble in acid media, it does not become effective until it reaches the alkaline juices of the intestinal tract



in which it is soluble. It is claimed to be a specific also in the treatment of gonorrhœa. Merlusan is supplied in form of tablets.—Pharm. Ztg., lviii (1913), No. 83, 830.

**Metarsan** is an organic arsenic compound which is exploited as a substitute for salvarsan and neosalvarsan in veterinary practice, and is claimed to combine the pharmacologic properties of atoxyl and salvarsan.—Pharm. Ztg., lviii (1913), No. 83, 830; from Berl. Tierärztl. Wschr., 1913, No. 41.

**Molliment** is the name of a new tuberculosis remedy which appears to be a combination of "thrice-deadened" tuberculin spores and sodium oleate. It is evidently identical with the remedy formerly known as "tebesapin," but occurs in the form of pills for internal administration, whereas "tebesapin" was supplied in the form of emulsion for subcutaneous use.—Pharm. Ztg., lviii (1913), No. 9, 88; from D. Med. Wschr., 1913, No. 4.

**Mulgatose** is the name given to a 50 per cent. emulsion of castor oil, emulsified with only 4 per cent. of albuminous and gummy substances. It is characterized by its attenuated fluidity, agreeable taste, and great permanence, having been kept about two years without separating.—Pharm. Ztg., lviii (1913), No. 55, 544; from D. Med. Wschr., 1913, No. 26.

**Neo-Hexal** is the name given to secondary hexamethylenetetramine sulphosalicylate, a colorless, crystalline powder, readily soluble in water, but with difficulty in alcohol.—Pharm. Ztg., lviii (1913), No. 94, 940.

**Neoleptol** is described as being "trimethyltrimethylenetriamin," a decomposition product of "pikrastol" (which see). It is a white, amorphous powder, very sparingly soluble in cold water, soluble in boiling water to the amount of 1.5 : 100, but absolutely insoluble in alcohol and ether. It is supplied in form of tablets, each containing 0.5 Gm., and is recommended in doses of 2 to 4 tablets three times daily, in epilepsy, hysteria and neurasthenia.—Pharm. Ztg., lviii (1913), No. 100, 1000; from Allgem. Med. Central-Ztg., 1913, No. 47.

**Neosalvarsan.** Following the introduction of salvarsan as a therapeutic agent came occasional reports of arsenical poisoning in cases in which it was administered. Many of these were explained as due to overdosage or to fault in the technique

of administration, but ill results occurred which admitted of no such explanation. Gradually neosalvarsan, a compound of arsenic of somewhat more complex molecular structure than salvarsan, has come into use, and experience indicates that it is the safer agent of the two; but neosalvarsan is not without its dangers.—J. Am. M. Assoc., v. 61, 2074. (M. I. W.)

**Neosalvarsan.**—M. E. Hagerty reports a case of neosalvarsan poisoning in which the remedy was administered under the most favorable circumstances; also includes notes on 3 almost identical cases.—J. Am. M. Assoc., 1913, v. 61, 1294-1295. (M. I. W.)

**Neraldol** is a new synthetic tannin now manufactured on a large scale, which promises to find large industrial use. According to the patent secured by its discoverer, it is produced by mixing phenols with an equal quantity of concentrated sulphuric acid, heating the mixture and then treating it with formaldehyde. When the reaction is ended, a nearly colorless, viscous-fluid mass results, which is soluble in cold water, producing a solution which can be used for tanning. Before use for this purpose, the product may be treated with an alkali, such as sodium hydroxide or carbonate, without, however, attaining complete neutrality and under no conditions alkalinity. Neraldol produces a blue-violet color with iron salts, produces precipitates with gelatin, and precipitates basic aniline coloring matters—in fact exhibits a number of characteristic tannin reactions.—Pharm. Ztg., lviii (1913), No. 87, 874; from Naturw. Wschr., 1913, No. 43.

**Neroin**, a specialty recommended as a remedy for rheumatic affections, is found by C. Mannich and L. Schwedes to consist of a solution of about 4 to 5 per cent. of camphor in denatured alcohol, colored green with chlorophyll.—Pharm. Ztg., lviii (1913), No. 36, 357; from Apoth. Ztg.

**Neu (Neo or New) Bornyval** is the bornyl ester of isovaleryl-glycolic acid, containing 53% of borneol, 34.5% of valeric acid, and 25.7% of glycolic acid, and is obtained by heating equivalent quantities of chloroacetic bornyl ester and valerates and purification of the product of the reaction by distillation *in vacuo*. Neubornyval so obtained is a colorless, almost completely odorless and tasteless oily liquid, insoluble in water, but readily soluble in alcohol, ether, benzol and fixed oils, and is particularly distinguished from the older preparation by its resistance to the action of acids, which permits its passage unchanged into the alkaline intestinal tract,

where with assimilation of water it is split into borneol, valeric acid and glycolic acid.—Pharm. Ztg., lviii (1913), No. 12, 130. from Münch. Med. Wschr., 1913, No. 5.

**Neurokardin**, a remedy for the treatment of alcoholic intoxication, nervous headaches, neurasthenia, hysteria, etc., is said to be prepared by a patented process from the rootstock of a *Piper* sp.—Pharm. Zentralh. (1913), No. 12.

**Newer Remedies.** *Their Introduction.*—Helbig discusses pro and con the methods used in the introduction of the newer remedies. Owing to the defects of some of the remedies the research chemists are constantly at work to make improvements, a point which is well illustrated in salvarsan and neosalvarsan. Helbig also criticizes the similarity in names, as well as the many different trade-mark names for identically the same preparation. Ph. Zhalle., 1913, No. 8. (O. R.)

**Opiopon** is the name given to an opium preparation which is exploited by its manufacturers as a substitute for "pantopon," a Swiss specialty which, according to the analysis of C. Mannich and L. Schwedes, is essentially composed of the hydrochlorides of the opium alkaloids (morphine, 47.5%; narcotine, 11.2%; codeine, 6.4%, and other alkaloids, 28.5%). The authors find, however, that "opiopon" as supplied varies in its composition, and cannot be accepted as an equivalent substitute for "pantopon."—Pharm. Ztg., lviii (1913), No. 13, 130.

**Optochin Hydrochloride** is the name given to ethylhydrocuprein hydrochloride. It is exploited as being an efficient remedy in pneumonia, and claimed to be also useful in the ophthalmic therapy.—Pharm. Ztg., lviii (1913), No. 94, 940.

**Pantopon-Atropinsulphuric Acid** is a new atropine preparation supplied in ampuls, each containing 0.02 Gm. pantopon and 0.001 "atropinsulphuric acid" (not to be confounded with "atropine sulphate"!)—Pharm. Ztg., lviii (1913), No. 31, 311.

**Paracodin** is the name given to a new codeine preparation, chemically "dihydro-codeine," which is distinguished from codeine by the solution of the hydrocyclic double-bond of morphine resulting from its hydrogenization. Dihydro-codeine is a base, crystallizing from alcohol in needles melting at 65° C., soluble in water, but easily salted out of solution by salts or alkalies. The sulphate being quite hygroscopic does not lend itself to medicinal

use as well as the hydrochloride or tartrate, both of which are supplied by its exploiters. The new compound is recommended as being superior to codeine for the relief of cough, and is given in doses of 0.02 to 0.05 Gm.—Münch. Med. Wschr., 1913, No. 10.

**Passulax** is the name given to an aperient grape-fruit confection containing 5 per cent of senna leaves.

**Pasta-Palm** is the new name given to a cathartic fruit paste originally introduced under the name of "Kenosan-Palm." It is composed exclusively of vegetable substances, mostly fruits, free from drastic additions and chemicals of every description, has an agreeable taste, and has no annoying effects on the stomach or intestine.—Pharm. Ztg., lviii (1913), No. 83, 830; from Südd. Ap. Ztg., 1913, No. 78.

**Perhydrit** is the name given to a solid hydrogen dioxide preparation, possessing excellent stability, obtained by the action of "perhydrol" ( $\text{H}_2\text{O}_2$ ) upon carbamid, and having a composition corresponding to the formula  $\text{CO}(\text{NH}_2)_2\text{H}_2\text{O}_2$ , a very small quantity of an acetylated oxyamino acid being added to secure its stability. Perhydrit forms a white, non-explosive crystalline powder, permanent in dry air, and readily soluble in water at  $15^\circ \text{C}$ . in the proportion of 1 : 25. By alcohol, and also by ether, it is partially split up into carbamid and hydrogen dioxide. It contains 34-35 per cent. of  $\text{H}_2\text{O}_2$ , and is exploited by its manufacturers for the convenient production of the latter in all cases in which the use of "perhydrol" is inconvenient or impractical, and, furthermore, as an addition to dusting powders. (See also "Hyperol.")—Pharm. Ztg., lviii (1913), No. 9, 88.

**Perrheumal** is the name given to an ointment containing 10 per cent. of the esters of tertiary trichlorbutyl alcohol with salicylic and acetylsalicylic acids. The ointment is recommended as being a non-irritant salicylic acid embrocation for the treatment of acute and chronic articular rheumatism, lumbago, etc.—Berl. klin. Wschr., 1913, No. 8.

"**Peruglycol**" is an obsolete name which was tentatively adopted for a 25% solution of the monobenzoic acid ester of ethylenglycol during the experimental clinical investigations of its value as a remedy for psora. Having proven effective for this purpose, it is now exploited under the name of



**Ristin**, which has the advantage of other itch remedies of being both colorless and odorless. It is now not known under the name of "peruglycol," but now and then prescribed under this name by some practitioners who probably formerly experimented with it. This has led to confusion with the names of "peruol" or "perugen" which are totally different remedial agents.—Pharm. Ztg., lviii (1913), No. 16, 155.

**Phthisanol** is a new name for "tuberculo-albumin," a preparation composed of pure cultures obtained from human- and neat-cattle tuberculoase from which the tuberculotoxins have been removed.—Pharm. Ztg., lviii (1913), No. 36, 356.

**Phylacogens**.—Phylacogens are neither serums nor vaccines but in a large measure toxic products of the metabolism of bacteria. They have not been scientifically investigated, they are not standardized, nor are they standardizable, and serious and even fatal results have followed their use.—J. Am. M. Assoc., v. 60, 1881. (M. I. W.)

**Phylacogens**.—Phylacogens have toxic properties and the claims for their therapeutic power are much more than the facts that are at present available would warrant.—J. Am. M. Assoc., v. 60, 373.

**Phylacogens**.—The shotgun mixtures sold under the proprietary name of phylacogens are undoubtedly a menace to vaccine therapy. The confidence of the public in serotherapy will be shaken and it remains to be seen how much of a set-back scientific medicine will receive from the orgy of advertising in which the exploiters of phylacogens are at present indulging.—J. Am. M. Assoc., v. 60, 602. (M. I. W.)

**Phylacogen**.—Franklin C. McLean reports a case of death following the administration of phylacogen for acute articular rheumatism. J. Am. M. Assoc., v. 60, 588. (M. I. W.)

**Pichigonal** is the name given to gelatin capsules containing the extracts of pichi-pichi (*Fabiana imbricata*) and of *Zea mays*, prepared by a special process, together with sandalwood oil.—Pharm. Ztg., lviii (1913), No. 27, 267.

**Pikrastol**, a new epilepsy remedy, is described as being "dimethyloldiformylmethenyltetramethylenepentamin," to which the empirical formula  $C_9H_{17}N_3O_1$  is assigned. In a pure condition, pikrastol is a strongly hygroscopic, colorless to light yellow mass.

barely fluid at the ordinary temperature, miscible in all proportions with water and alcohol, difficultly soluble in chloroform and acetone, and absolutely insoluble in benzol, ether and ligroin. It is supplied in 25% solutions, of which the dose is 5 to 50 drops three times daily.—Pharm. Ztg., lviii (1913), No. 101, 1012; from Allgem. Med. Central-Ztg., 1913, No. 47.

**Pilulæ Arsogujacolicæ** (Guaiacolarсениc pills) are exploited as a specific for tuberculosis. They are supplied in two strengths (Nos. I and II), containing, respectively, 0.0005 and 0.00075 Gm. of arsenous acid in combination with guaiacol.—Pharm. Ztg., lviii (1913), No. 36, 356.

**Pinosol**, an odorless tar preparation (see Year Book, 1912) has been subjected to therapeutic experiment by Dr. R. Polland, who finds it, as claimed by its exploiters, to be an efficient substitute for *oleum rusci*, and an excellent remedy in dry and weeping eczemas, psoriasis, pruritus, scabies, etc.—Pharm. Ztg., lviii (1913), No. 52, 512; from Oesterr. Aerzte-Ztg., 1913, No. 3.

**Placentapepton** is a preparation of peptone derived from the placenta and employed for the purpose of the optical test for pregnancy according to Abderhalden. Placentapepton is a yellowish powder, soluble in water and having the properties of peptone.—J. Am. M. Assoc., 1913, v. 61, 1377. (M. I. W.)

**Plantacid Preparations** are preventive remedies when there is inclination of augmenting the formation of acid in the juices of the organism and for combatting the uric acid diathesis. These preparations depend for their efficiency upon alkali in combination with vegetable acids and upon saline combinations which have stood the test of time in their salutary activity. The plantacid-alkali salts are supplied in the form of "sprudel salts" (effervescent salts), such as, for instance, "Plantacid-alkali citrates." These are marketed in form of tubes, 10 to 32 in original packages.—Pharm. Ztg., lviii (1913), No. 32, 317.

**Primal.** *New Hair Dye.*—According to Colman, this dye is prepared from the poisonous para-phenylenediamine, from which the irritating and toxic properties are removed by reducing agents. Should this prove true, then this hair dye will be a very valuable cosmetic.—Suedd. Ap. Ztg., 1913, No. 88. (O. R.)

**Protargol and Its Substitutes.**—According to the researches of L. Krocher, the various substitutes in the market for protargol

contain the same amount of silver ever since the German Pharmacopœia standardized *Argentum proteïnicum*. Nevertheless, many of the substitutes do not possess the same physical properties as the original protargol. The author reaches the conclusion that protargol and the proteinates of silver in the market cannot be considered identical, quite especially as different protein bodies are used in their preparations. —Apoth. Ztg., 1913, No. 1. —O. K.]

**Providol Soap** is the name given to a non-irritant antiseptic soap, prepared by a patented process, and containing 1 per cent. dioxymercuriphenolsodium. —Pharm. Ztg., lviii (1913), No. 43, 428.

**Pydonal** is the name given to a specialty in tablet form which according to the analysis of C. Mannich and L. Schwedes contains in each tablet: Acetylsalicylic acid, 0.22 Gm.; pyramiden, 0.11 Gm.; starch, milk-sugar and mineral matter, 0.21 Gm. —Pharm. Ztg., lviii (1913), No. 57, 564.

**Radamanit** is the name given to a radium-carbon preparation composed of a carbon powder highly charged with radium emanations with which it parts very readily. It is supplied in soldered silver or magnalium containers and must be used rapidly, since it loses 16 per cent. of its activity within the first 24 hours and about one-half in the course of 4 days. The preparation is exploited as a remedy for cancer. —Pharm. Ztg., lviii (1913), No. 87, 874.

**Remede d'Abyssinie Exibard** is a French asthma remedy which is said to contain a particularly effective sort of belladonna leaves. The preparation, which has long been known, consists of a very fine powder; it burns slowly, evolving non-irritant vapors which are quickly effective. The remedy is supplied also in the form of cigarettes. —Therap. d. Gegenw., 1913, No. 4.

**Resaldol** is the name given to the resorcinbenzoylcarbonicacid-ethylester, obtained from fluorescein by splitting off a resorcin molecule and esterifying the liberated carbonyl group. It is a light yellowish, handsomely crystallized body, very sparingly soluble in water, and melting at 134° C. Resaldol, which has a similar anti-diarrhetic action to cotoin, is free from the peppery taste of the latter, and does not produce any irritant effect whatever on the mucous membranes; hence it is recommended as a substitute for cotoin when this is indicated. —Pharm. Ztg., lviii (1913), No. 83, 830; from D. Med. Wschr., 1913, No. 38.

**Rheuma-Cellon** is a "Cellon Ointment" (which see) containing as active constituents 6% each of methyl salicylate, salicylic acid and oil of turpentine.—Pharm. Ztg., lviii (1913), No. 87, 874.

**Riba-Malz** is the name given to a nutrient specialty composed of "Riba" (an albumose preparation obtained from fish flesh) and malt. Riba-malz is readily soluble in water and in the nutrient beverages ordinarily in use, such as milk, yoghurt, coffee, cacao, soups, etc., and is recommended on the ground of its solubility, its palatability, and its acceptability by the stomach.—Pharm. Ztg., lviii (1913), No. 89, 894; from Therap. d. Gegenw., 1913.

**Ringer's Solution.**—The following is the formula:

Sodium chloride.....	7.5 Gm.
Potassium chloride.....	0.42 Gm.
Calcium chloride.....	0.24 Gm.
Distilled water, to make.....	1000 Cc.

To be dissolved, filtered and sterilized. (O. R.)

**Riopan** is the name given to an ipecacuanha preparation of high concentration, claimed to be obtained from the best Riopieac, and to consist in the amount of 50 per cent. of its alkaloidal constituents in saline combination. It is supplied in form of a fine, brownish, water-soluble powder, and is in form of tablets, each containing 0.001 Gm. ipecacuanha alkaloids (corresponding to 0.05 Gm. of the drug).—Pharm. Ztg., lviii (1913), No. 86, 861.

**Romanxan** is the name given to a new nutrient substance which is claimed to be composed of the prot-albumoses of milk albumen, metaphosphoric acid and iron salts. It is said to contain 10% of nitrogen and 1% of iron.—Pharm. Ztg., lviii (1913), No. 21, 210.

**Sali-Neol Boer** is the name given to a rheumatism remedy containing menthol, capicum-chloroform (1 : 10), and a salicylic-acidester, in a soft, non-irritant saponaceous ointment base.—Pharm. Ztg., lviii (1913), No. 64, 631; from Berl. Aerzte-Corr., 1913, No. 28.

**Salrado Compound**, examined by C. Mannich and L. Schwedes, consists of a solution of the citrates and bicarbonates of lithium and sodium in an aqueous extraction of drugs containing emodin and chrysophanic acid, flavored with cloves and peppermint, and preserved with salicylic acid and 1% of alcohol. These findings agree in essentials with the prospectus of the manufacturers, ac-



cording to which the preparation consists of the extracts of cascara sagrada and of gentian, caffeine citrate and lithium citrate, and sodium bicarbonate.—Pharm. Ztg., lviii (1913), No. 27, 268.

**Salvarsan.**—Oulmann and Wollheim describe the administration of salvarsan and of neosalvarsan by enteroclysis. They believe that the administration of these drugs by enteroclysis has a place in therapeutics and should be the method of choice when the intravenous method is not feasible.—J. Am. M. Assoc., 1913, v. 61, 867-868.

**Salvarsan.**—Experience has shown that even under the most favorable conditions a *therapia magna sterilisans* cannot be secured uniformly in syphilis by means of one or two injections. It will require years of experience and observation before the accurate range and limits of action of salvarsan and neosalvarsan are established.—J. Am. M. Assoc., 1913, v. 61, 686. (M. I. W.)

**Salvarsan.**—In salvarsan and neosalvarsan reliance is placed in combinations of arsenic of complex molecular structure. In this form the arsenic is relatively non-toxic, but, as in the case of many other compounds, the biochemical agencies of the body may split the complex chemical structures into simpler ones, reducing the non-toxic combinations into products which may be highly toxic to the tissues of the human organism. So long as we are not able to predict with certainty what chemical reactions may take place within the body under various conditions, there will remain more or less risk connected with the administration of drugs so potentially toxic as are these higher compounds of arsenic. For future guidance, all instances of unfavorable outcome after their use should be recorded in detail with great care.—J. Am. M. Assoc., v. 61, 3074. (M. I. W.)

**Salvarsan.**—William Thomas Corlett reports on two and one-half years' experience with salvarsan and neosalvarsan and concludes that when the drug is properly used and by experienced persons it is a most valuable weapon against the *Spirochata pallida*. To insure against untoward results, however, one must exercise care as to the selection of cases and after ascertaining that no physical disqualification exists, one should further exercise care in not giving too large doses. Great care should be taken as to the purity and sterility of the distilled water. The reaction of the patient should be carefully watched, and, if very severe, further injections should be given with exceeding care. As to the

relative therapeutic value of the old and the new salvarsan he has been unable to detect any difference.—*J. Am. M. Assoc.*, 1913, v. 61, 961-965. (M. I. W.)

**Salvarsan.**—H. H. Hazen, in view of the tendency for late abscess formation following oily injections and in view of the pain of all other methods, feels that the intravenous method should be the only one employed, remembering, of course, that it should be used very carefully in cases, notably those in which there are diseases of the heart or central nervous system. —*J. Am. M. Assoc.*, v. 60, 1618. (M. I. W.)

**Salvarsan.**—F. Berger reviews his experience in the treatment of syphilis. He uses salvarsan combined with mercury inunctions and insists on chronic intermittent treatment for five years (*Münch. Med. Wschr.*, 1912, v. 60, No. 43).—*J. Am. M. Assoc.*, v. 61, 2112. (M. I. W.)

**Salvarsan.**—H. Fuchs reports a case of secondary manifestations of syphilis with normal heart findings, which developed heart-block from treatment with salvarsan. The patient was given up to 2.3 Gm. salvarsan in the course of 9 weeks, and 48 hours after the last intravenous injection of 0.6 Gm. of salvarsan actual heart-block developed. This was confirmed by the electrocardiogram. As the toxins were absorbed conditions returned to normal—in seven days in this case. (*Münch. Med. Wschr.*, v. 60, No. 42.)—*J. Am. M. Assoc.*, 1913, v. 61, 2024. (M. I. W.)

**Salvarsan versus Profeta's Law.**—Augustus Ravogli observes that Profeta's law maintains that the child coming from syphilitic parents has acquired a congenital immunity, which protects it, at least temporarily, from syphilitic infection. In the presence of the Wassermann test and of the administration of salvarsan, Colles-Baumes' and Profeta's laws have no right to existence. Syphilitic immunity lasts as long as the disease lasts.—*J. Am. M. Assoc.*, 1913, v. 61, 95-97. (M. I. W.)

**Salvarsan.** According to Robertson intramuscular injections of salvarsan and neosalvarsan produce severe destructive lesions which always heal slowly and often are complicated by hemorrhages and sloughing abscesses. The severity of the reaction from the use of either drug is essentially the same, and the lesions produced by experiments on animals and in human beings are similar in every respect. Mercurial preparations when injected into mus-

cles produce similar lesions, and the use of such preparations in this manner, in the majority of cases, is an unjustifiable procedure.—J. Am. M. Assoc., 1913, v. 61, 1698-1702. (M. I. W.)

**Salvarsan.**—R. Obermiller ridicules the attempts to explain the mishaps after salvarsan by attributing them to anything except the toxic action of arsenic which salvarsan shares with all other preparations of arsenic. (Berl. klin. Wschr., v. 50, No. 44.)—J. Am. M. Assoc., 1913, v. 61, 2198. (M. I. W.)

**Salvarsan.**—Wadhams and Hill report 3 cases of amœbic dysentery treated with salvarsan and point out that while it is perfectly evident that the limited number of cases proves nothing, yet the results have been so striking as to make it seem desirable to report them in order that others with more clinical material may investigate the matter further.—J. Am. M. Assoc., 1913, v. 61, 385-386. (M. I. W.)

**Sargol**, a French nutrient specialty in form of tablets, has been subjected to analysis by C. Mannich and S. Kroll with the following results: Water, 4.23%; mineral substances, 3.75%; nitrogenous substances, 7.44%; ether extract (fat), 3.12%; crude fiber, 1.35%; saccharose, 53.48%; glucose, 2.65%; alcoholic phosphatides, corresponding to 0.075%  $P_2O_5$ ; caffeine, traces. Solubility in cold water, 62.4%. From these results it is concluded by the authors that sargol does not possess any special nutrient activity. The nutrient value of 1 Kgm. of the material amounts in rounded numbers to 3700 calories.—Pharm. Ztg., lviii (1913), No. 57, 564.

**Secalysat** is the name given to a dialysate prepared from ergot, containing the active constituents of this drug in combination with 2.5 to 5.0% of cotarnine hydrochloride—the latter increasing the potency of the remedy.—Therap. d. Gegenw., 1913, No. 2.

**Seidenpepton "Höchst"** is the name given to a tyrosin preparation of relatively uniform composition and readily soluble in water, which is employed as a diagnosticum for proteolytic ferments, and intended particularly for investigations in the domain of bacteriology.—Pharm. Ztg., lviii (1913), No. 26, 258.

**Sennatin** is a new purgative designed for subcutaneous and intramuscular application, containing all the active principles of senna leaves but excluding those substances that are liable to produce unpleasant side-effects. It is a dark, clear, stable and sterile

fluid of sp. gr. 1.045-1.075, containing 1 to 2 per cent. of ash, and is claimed to produce in doses of 1 to 3 Gm. energetic expulsion of intestinal gases and evacuation of the bowels.—Pharm. Ztg., lviii (1913), No. 3, 26; from Münch. Med. Wschr.

**Sennax** is the name given to a soluble senna glucoside obtained from senna leaves by a patented process and claimed by its exploiters to be, together with another body, which is insoluble and has been named "sennoid," the active purgative constituent of the drug. Sennax is described as a yellowish, amorphous, light, hygroscopic powder, of unlimited stability if properly preserved; readily soluble in water and diluted alcohol, with difficulty soluble in strong alcohol, and insoluble in most other organic solvents.—Pharm. Ztg., lviii (1913), No. 57, 563.

**Sennax** is supplied in form of milk-sugar triturations, in form of powder, in tablets containing chocolate, and in solution, preserved with alcohol and aromatized with fruit essences. Each tablet contains 0.3 Gm. of sennax (= 0.075 Gm. of the pure glucoside), and corresponds to one teaspoonful of the sennax solution.—Pharm. Ztg., lviii (1913), No. 73, 729.

**Simi**, a skin cosmetic, has been found on examination by L. Schwedes to consist of a 4 per cent. solution of boric acid in perfumed spirit.—Pharm. Ztg., lviii (1913), No. 36, 357.

**Sinemellit Tablets**, recommended in glucosuria, are said to contain extracts of *Peumus boldus*, Molina, and of huckleberries, magnesium peroxide, and a specially prepared medicinal form of yeast.—Pharm. Ztg., lviii (1913), No. 67, 669; from Apoth. Ztg., xxviii (1913).

**Solargyl** is the name given to a compound of silver oxide with proteoses and their products of disintegration, containing 30 per cent. of silver, and while insoluble in organic solvents, is readily soluble in water, forming a red-brown solution which may be sterilized and preserved without decomposition. It occurs in form of small, metallic-glistening scales, which are non-hygroscopic and not sensitive to the action of light.—Pharm. Ztg., lviii (1913), No. 23, 229.

**Somnisan** is a weak alcoholic fluidextract of valerian, prepared by percolation from the two-year-old drug, and recommended in doses of 20 to 30 drops for various nervous ailments,



and doses of  $\frac{1}{2}$  to 1 teaspoonful in nervous insomnia.—Pharm. Ztg., lviii (1913), No. 48, 472.

**Stovaine.**—*Incompatibility.*—Paul Demaire reports that after the preparation of the following prescription:

Sodium cinnamate.....	0.1 Gm.
Stovaine.....	0.1 Gm.
Distilled water.....	10.0 Gm.

a cloudiness occurred, and then separation of an oily substance, and upon standing, a crystalline precipitate was formed. The examination of the sodium cinnamate, which was used, showed that this was distinctly alkaline, and therefore was incompatible with stovaine. By the use of a neutral salt, no incompatibility was observed.—Repert. Pharm., 1913, 341. (O. R.)

**Supra-Serol**, a substitute for suppositories, is a novelty which is supplied in the form of small collapsible tubes, each containing a dose of the required medicament incorporated with a water-soluble mass. In use these tubes are screwed by their opened end to a colon-tube accompanying, which, after insertion into the anus, delivers the medicament direct to the desired spot by simple pressure upon the tube.—Pharm. Ztg., lviii (1913), No. 36, 357.

**Tubolytin** is the name of a new tuberculin preparation which is recommended as substitute for "old-tuberculin" over which it is claimed to possess certain desirable advantages. In its preparation from tubercle bacillus cultures, higher temperatures and the use of destructive chemicals are avoided so that, although its tuberculin value when administered subcutaneously to guinea pigs is only one-fifth that of "old-tuberculin," it is approximately equal to the latter when administered intracutaneously to the same animals. Moreover, the residue of evaporation from tubolytin is 100 times, the ash content 29 times, and the nitrogen content approximately 43 times lower than in case of "old-tuberculin."—Pharm. Ztg., lviii (1913), No. 64, 631; from Berl. klin. Wschr., 1913, No. 31, 1447.

**Tussaloin** is the name given to a solution of *Hydrochinium hydrochloricum*, Zimmer, in an 0.8 per cent. of salt solution.—Pharm. Ztg., lviii (1913), No. 67, 669.

**Tussobromin** is the name given to a compound syrup of bromoform, containing, besides bromoform, some aconite, codeine and balsam of tolu. It is recommended in whooping-cough, asthma

and catarrh, in tablespoonful doses for adults and teaspoonful doses for children.—Pharm Ztg., lviii (1913), No. 64, 632.

**Tysablenal** is the name given to tablets containing sodium benzoate, sodium salicylate and thymol.—Pharm. Ztg., lviii (1913), No. 83, 830.

**Tenosin** is the name given to a new ergot preparation containing the bases *p*-oxyphenylethylamine and  $\beta$ -imidazolyethylamine as essential therapeutic constituents. It is a colorless sterilized fluid, and is supplied both in drop-glasses and in ampuls of 3 to 10 Gm. capacity, the dose being 20 drops internally or 1 Cc. intravenous or intraglutaral, 3 times daily.—Pharm. Ztg., lviii (1913), No. 43, 428.

**Terpacid** is the name given to a specialty recommended in all cases in which camphor has been employed, particularly for embrocations and baths in rheumatic and nervous affections. It consists of pure "fenchon," which is obtained by oxidation from fenchyl alcohol, and is supplied in form of a water-clear, mobile liquid, having a camphor-like, bitter and pungent taste, and is soluble in most of the organic solvents. Its sp. gr. is 0.950; boiling point, 193°–196° C.; optical rotation, dextrogyre but fluctuating.—Pharm. Ztg., lviii (1913), No. 27, 268.

**Terpinomenth** is the name given to a new inhalant which is composed of menthol, oil of *Pinus pumilio*, oil of eucalyptus and oil of turpentine. It is employed in affections of the air passages both as a spray and an inhalant—in the latter case in doses of 5 to 10 drops poured upon hot water.—Allgem. Med. Central-Ztg., 1913, No. 9.

**Testijodol** is the name given to an iodo-ferric product prepared from blood which may be regarded as being chemically a compound of iodine, iron and albumen. It is supplied in the form of a voluminous dark brown, nearly odorless and tasteless powder, insoluble in water and diluted acids, but readily soluble in alkalis. Testijodol contains 81.48% of albumen, 15.24% of iodine, and 0.25% of iron. It is recommended for the iodine therapy in doses of 1 Gm., given 3 to 4 times daily in form of powder, pills or tablets.—Pharm. Ztg., lviii (1913), No. 91, 940; from Vierteljahrschr. f. prakt. Pharm., 1913, No. 3.

**Theoform** is a condensation product of theobromine with bodies splitting off formaldehyde, to which 20 per cent. of citric acid is

added to secure stability. It is a white, strongly bitter-tasting powder, containing 68.4 per cent. of theobromine, soluble in 50 parts of water. Theobrom is exploited as a substitute for diuretin and is recommended in doses of 1.0 Gm. — Pharm. Ztg., lviii (1913), No. 64, 631; from Centralbl. f. d. ges. Therap., 1913, 377.

**Thymin** is a new specialty obtained from the thymus of calves, consisting of an aqueous extract of the gland prepared by a special method *in vacuo* and under aseptic conditions, the albuminous products being carefully removed. Thymin is supplied in form of tablets of 0.5 Gm. each, two of them containing 0.052 Gm. of nitrogen. It does not give the biuret reaction; recommended in Basedow's sickness and insomnia. Pharm. Ztg., lviii (1913), No. 89, 894; from D. Med. Wschr., 1913, No. 44.

**Thyroprotein** is a concentrated extract, representing the active constituents of the thyroid gland, standardized to a definite iodine content.

**Toxynon** is a new mercury preparation intended for intravenous injections in syphilis. It is represented to be acetaminomercuri-benzoate of sodium and contains 48 per cent. of mercury. According to the structural formula the mercury is joined to the aromatic nucleus in single valence; the hydrogen atom in the amido group is replaced by an acetic acid radical. Toxynon is difficultly soluble in cold water, more readily in salt solution and very readily in piperazin solution of 0.2 per cent. It is supplied in ampuls, dissolved in physiological salt solution, and the dose is from 0.1 to 0.15. Pharm. Ztg., lviii (1913), No. 71, 709; from Berl. klin. Wschr., 1913, No. 34.

**Traumaplast** is the name given to an absorbent bandaging material, intended to replace the non-absorbent plasters usually employed on suppurating wounds, in vaccination, etc. Unless otherwise specified the traumaplast is impregnated with dermatol. — Pharm. Ztg., lviii (1913), No. 36, 357.

**Tricalcol** is the name given to a compound of calcium phosphate and albumen, which is recommended by its manufacturers for preparing a calcareous albumin milk. It is supplied in form of a white, odorless and tasteless powder, containing about 20 per cent. of calcium triphosphate and 10.5 per cent. of nitrogen; readily soluble on addition of small quantities of soda or bicarbonate solution, forming an opalescent liquid, slightly reddish by reflected

light, but perfectly clear by transmitted light. Its faintly alkaline solution may be heated to boiling without precipitating calcium phosphate.—Pharm. Ztg., lviii (1913), No. 64, 631.

**Trixidin** is the name given to a 30% emulsion of antimony trioxide which has been used with success in veterinary practice for the treatment of trypanosoma.—D. Med. Wschr., 1913, No. 18.

**Tryen** is an organic iodine compound of the aromatic series and remotely a derivative of iodbenzol, entitled in its chemical relations to the designation "paraiodorthosulphooxycyclohexatrienpyridin." It is a yellow, perfectly inodorous powder, soluble in hot water, and in suitable doses without deleterious effect upon the human or animal organism. Tryen is supplied in substance, in form of gauze, and in tampons, and is recommended by its exploiters for the dry-treatment of vaginal and uterine catarrhs.—Pharm. Ztg., lviii (1913), No. 3, 26; from Berl. klin. Wschr.

**Ulsanin** (Hydroiodoborate) is recommended as a non-toxic but active wound remedy and disinfectant. The prophylactic action of this new preparation, which occurs in form of a somewhat hygroscopic powder, is attributed to its property to split off iodine and oxygen in contact with wound secretions.—Pharm. Ztg., lviii (1913), No. 64, 632; from D. Med. Wschr., 1913, No. 31.

**Uranoblen** is a new antigonorrhœic composed of silver and uranium. It is a red-brown powder, containing about 40 per cent. of silver, and soluble in water, forming a yellow, strongly fluorescent solution, which is not precipitable by albumen or salts. Notwithstanding its high silver content, uranoblen is perfectly non-irritant when employed under the specified directions. It has a powerful, destructive effect on gonococci and possesses deep-seated activity.—Pharm. Ztg., lviii (1913), No. 87, 874; from D. Med. Wschr., 1913, No. 43.

**Valamin** is the name given to the isovalerianic acid ester of amylenhydrate, corresponding to the formula  $\text{CH}_3\cdot\text{CH}_2\cdot\text{CH}_2\cdot\text{COOC}_5\text{H}_9$ . It is a colorless, neutral liquid having an aromatic ethereal taste and an odor reminding one of valerianic acid. Valamin is indicated in cases in which valerian preparations are generally used, and is supplied in the form of capsules containing 0.25 Gm. of the medicament, which, though miscible in all proportions with oils, is but very sparingly (1 : 1000) soluble in water. Given in doses of 0.25 Gm. 3 to 4 times daily, it acts as a pronounced sedative;



in moderate cases of nervous insomnia good results are obtained, giving 0.5 Gm. (2 capsules) at night before retiring.—Therap. d. Gegenw., 1913, No. 4.

**Valbromid** is the name given to an effervescent salt containing bromine and valerian.—Pharm. Ztg., lviii (1913), No. 97, 973.

**Vasohypertensin** is a preparation obtained from the hypophyse, which Prof. L. Popielski recommends in place of the usual hypophyse preparations hitherto recommended for increasing blood pressure. It is a constituent of all animal organisms, and is obtained from the hypophyse as follows: The fresh hypophyse is triturated and boiled with water, the filtrate concentrated and precipitated with phosphomolybdic acid, the phosphomolybdic acid decomposed with barium hydroxide, the barium precipitated with  $\text{H}_2\text{SO}_4$ , and the filtrate from this treatment evaporated to dryness with soda, the dry residue being then extracted in 96% alcohol. The alcoholic solution is now precipitated with alcoholic sublimate, and the "vasohypertensin" is thus obtained in a relatively pure condition. It is not decomposed at  $100^\circ \text{C}$ . either in acid or in alkaline media. The hypophyse itself may be preserved in absolute alcohol, which does not affect the active constituent.—Pharm. Ztg., lviii (1913), No. 53, 523; from Berl. klin. Wschr., 1913, No. 25. .

**Veropyrin** is the name given to a combination of veronal and aspirin with 0.01 Gm. of morphine *pro dosi*, which is said to be employed as a hypnotic and sedative.—Pharm. Ztg., lviii (1913), No. 31, 311.

**Villerino**, a specialty recommended as a remedy in dropsy, has been subjected to examination by C. Mannich and L. Schwedes. While the chemical analysis did not determine the active constituents of this remedy, which are stated by its exploiters to consist of "rosavill," the physiological tests reveal the presence of considerable quantities of a cardiac poison. Consequently this preparation should not be used until a distinct declaration of its composition is submitted by its manufacturers.—Pharm. Ztg., lviii (1913), No. 36, 357.

**Wisbola** is the name given to a new bismuth-bolus bandage for burns, which is claimed to have the advantage of extraordinary absorptive properties.—Pharm. Ztg., lviii (1913), No. 57, 563.

**Wollinicum**, a Berlin toothache remedy, has, according to an analysis of Dr. Aufrecht, a composition corresponding to the fol-

lowing formula: Chloroform, 20; alcohol, 30; oil of cloves, 50 parts.—Pharm. Ztg., lviii (1913), No. 103-104, 1035.

**Yatren** is the new name given to "Tryen," an organic iodine compound, explained to be "paraiodorthosulfooxy cyclohexatrien-pyridine," which is exploited as a wound antiseptic.—Pharm. Ztg., lviii (1913), No. 83, 830; from D. Med. Wschr., 1913, No. 38.

**Zincperhydrol.**—This preparation is a mixture of equal parts of chemically pure zinc peroxide and zinc oxide. It is an odorless white powder, which does not change with age. It has been introduced into therapy as a healing and dusting powder and as an absorbent, and has largely replaced iodoform.—Klin. therap. Wschr., 1912, No. 36. (O. R.)

## MATERIA MEDICA

### A—GENERAL SUBJECTS

**Medicinal Plants.**—*Improvement by Cultivation.*—F. A. Miller, in response to a suggestion made at a meeting of the Indiana Academy of Science, for the possible improvement of valuable forms of medicinal plants through the application of breeding methods, has carried out a number of the suggestions made, and reports the results in an illustrated paper which was read at a recent session of the Botanical Section of the Academy. The illustrations and descriptions include experimental plots exhibiting growing plants of *Belladonna*, *Digitalis*, and *Cannabis* of different varieties, sources and conditions of development.—Journ. A. Ph. A., June, 1913, 730-734.

**The Medicinal Plant Garden of the University of Minnesota.**—*A Valuable Adjunct to the Curriculum of the College of Pharmacy.*—At the Denver meeting of the Association, Dean Wulling, of the Minnesota College of Pharmacy, presented an interesting paper on the progress that has been made in the establishment of the medicinal plant garden, authorized shortly after the College of Pharmacy was organized (in 1892), and begun a few years afterwards. From data furnished by Professor Newcomb, to whom much of the success of the garden is due, it follows that it has proven an important adjunct to the curriculum of the college,

permitting the study of medicinal plants in directions which, under prevailing conditions, are impracticable and mainly theoretical. This interesting paper, which is illustrated by photographs of the garden, should be consulted in the Journ. A. Ph. A., June, 1913, 692-696.

**Economic Fruits and Seeds.**—*Anatomic Character*. "Dr. K." contributes a historical study of the development in the anatomical investigation of a number of useful fruits and seeds, accompanied by numerous drawings in explanation of the text. This interesting paper embraces investigations of *Ribes grossularia*, L., *Ribes rubrum*, L., *Cydonia japonica*, Pers., *Pirus communis*, L., *Pirus malus*, L., *Prunus domestica*, L., and *Fragaria vesca*, and may be consulted in the original, which appears in Ztschr. d. allgem. Osterr. Apoth.-V., 1913, No. 1, *et seq.*

**Herbs and Leaves.**—*Identification Value of Hairs in Their Examination*.—James Small communicates the results of a notable examination, undertaken at the suggestion of Mr. E. M. Holmes, for the purpose of ascertaining the identification value of plant hairs in the microscopic examination of herbs and leaves, restricting the present survey to the *Labiata* and allied orders of the *Tubiflora*. These drugs were derived from species in the *Boraginaceæ*, *Solanaceæ*, *Scrophulariaceæ*, *Labiata*, and *Verbenaceæ*, the method adopted including the examination of surface and transverse sections of stem and leaf; and, as all the material was in the dried condition, the figures shown by the numerous cuts illustrating this paper, represent collapsed cells and other irregularities, which are absent, as a rule, in fresh material.

The hair-like processes noted are classified by the author in two main divisions:

1. **Simple Hairs.**—These are unicellular or multicellular; usually uniserial, *i. e.*, arranged in one row, but in some instances partially biserial.

2. **Glandular Hairs.**—This group is conveniently divided into three smaller groups, *viz.*

(a) **Glands**—sessile, or with a *short*, unicellular stalk, the glandular head being composed of one, two, three, four, eight (exceptionally more than eight) cells, all in one layer, with exceptionally thick walls.

(b) **Glands**—with a *long*, usually multicellular, but rarely unicellular, stalk and has glandular heads composed

of one, two, or numerous cells with comparatively thick walls.

(c) **Oil Glands**—sessile, larger than (a) or (b), and with comparatively thin walls.

A systematic description of the hairs of the following plants is given in support of the author's conclusions, but must be consulted in the original for comparison with the illustrations, comprising a total of forty-three figures:

**Boraginaceæ.**—Comfrey Herb (*Symphytum officinale*); Borage (*Borago officinalis*).

**Solanaceæ.**—Stramonium Leaves (*Datura stramonium*); Henbane Leaves, exotic (*Hyoscyamus niger*); Henbane Leaves, biennial, (*Hyoscyamus niger*); Bittersweet (*Solanum dulcamara*); Belladonna Leaves (*Atropa belladonna*).

**Scrophulariaceæ.**—Mullein Leaves (*Verbascum thapsus*); Figwort (*Scrophularia nodosa*); Water Betony (*Scrophularia aquatica*); Digitalis Leaves (*Digitalis purpurea*); Speedwell (*Veronica officinalis*); Brooklime (*Veronica beccabunga*); Eyebright (*Euphrasia officinalis*); Hedge Hyssop (*Gratiola officinalis*).

**Labiataæ.**—Sage Herb (*Salvia officinalis*); American Bugle (*Lycopus virginicus*); Basil Herb (*Ocimum basilicum*); Spearmint (*Mentha viridis*); Peppermint (*Mentha piperita*); Pennyroyal (*Mentha pulegium*); Thyme Leaves (*Thymus serpyllum*); Hyssop (*Hyssopus officinalis*); Marjoram (*Origanum marjorana*); Calamint (*Calamintha officinalis*); Balm (*Melissa officinalis*); Ground Ivy (*Nepeta glechoma*); Catmint or Catnip (*Nepeta cataria*); Self-Heal (*Prunella vulgaris*); Skull cap (*Scutellaria galericulata*); Horehound (*Marrubium vulgare*); Wood Betony (*Leonurus cardiaca*); Wood Sage (*Teucrium scorodonia*); Germander (*Teucrium chamædrys*); European Ground Pine (*Ajuga chamæpitys*).

**Verbenaceæ.**—Verbena odorata (*Aloysia citriodora*); Vervain (*Verbena officinalis*).

The examination of these various hairs leads the author to conclusions which may here be condensed as follows:

1. That the diagnostic or identification value of hairs is very considerable, at least in the orders examined, even within the limits of a genus, since, although different species of the same genus have one or more kinds of hairs in common, each species nearly always has some kind of hair which is entirely different from anything borne by the other closely allied species.



2. That the diagnostic value of hairs depends upon the observation of:

- (a) The simple or glandular character of the hairs;
- (b) The presence or absence of excrescences upon the surface of the hair, and the arrangement and character of such excrescences;
- (c) The character, sharp or rounded, of the apex;
- (d) The thickness or thinness of the cell wall and the character of the wall at the apex;
- (e) The presence or absence of joints, or swellings, at the septa;
- (f) The arrangement, uniserial or biserial, of the cells of the multicellular hairs;
- (g) The limits within which the number of cells in the multicellular hairs varies;
- (h) The unicellular or multicellular structure of the heads of the glandular hairs, especially of type (b).

It is, perhaps, worth noting the interesting manner in which the author's observations bear out the idea that although the quantity of the hairs borne by any one species may vary with the habitat, the characters of the hairs have been passed on to allied species and genera from their common ancestor.—Pharm. Journ. and Pharmacist, April 26, 1913, 587-591.

**Oil Seeds.**—*Some Unfamiliar Sorts.*—The Kew Bulletin (1913, No. 3, 127) describes the properties and applications of a number of seeds unfamiliar to the English market as oil seeds, which have recently made their appearance, as follows: *Lucuma Mammosa* (Sapotaceæ), Mamme Sapote, is a tree of tropical America often cultivated in the West Indies for its fruit, which has an agreeably flavored pulp bearing some resemblance to quince marmalade. The seed is polished, with a large scar, and the kernel, which contains hydrocyanic acid, is used in the West Indies for flavoring, as a substitute for bitter almonds. The cow pea, *Vigna Catiang* (Leguminosæ), is an annual, widely cultivated in the tropical zone for its seeds, which are used as food. The stalks and leaves are said to be employed in the preparation of a green dye. The seeds of the African locust, *Parkia biglobosa* (Leguminosæ), a native tree of tropical Africa, with seed pods 8 to 12 inches long, are used, when parched, as coffee in the preparation of a beverage. The seeds of *Pongamia glabra* (Leguminosæ), an evergreen tree of the tidal river banks all round India, Burmah, and Ceylon, are used in native medicine, and they also yield a

thick red-brown oil used for burning, but it is not popular for the purpose on account of its offensive odor. It is employed in medicine for outward application in skin diseases, for rheumatism, and to destroy worms in sores. The Marking Nut tree of India, *Semecarpus anacardium* (Anacardiaceæ), has a fruit which contains the corrosive juice which forms the marking ink extensively employed in India to give a black color to cotton fabrics. The drupe is sometimes eaten; the kernels contain a small quantity of sweet oil; the pericarp contains 32 per cent. of a vesicating oil of specific gravity 0.991, easily soluble in ether, and blackening on exposure to the air. The seeds of *Hydnocarpus venenata* (Bixineæ), a larger tree of Ceylon, yield an oil of the consistence of ordinary hard salt butter, known in Kanara as "Thortag" oil, which is used in the treatment of skin diseases, leprosy, etc. If eaten, the seeds produce giddiness, and they are used as a fish poison by the natives; the fish which are poisoned by them, however, are unfit for food. The seeds of *Mesua ferrea* (Guttiferæ), the Ironwood of Assam, resemble chestnuts in form and color. The kernels yield 72.9 per cent. of a deep brown or yellow oil, very bitter, which deposits white crystalline fats at ordinary temperatures. The oil is used in India for burning in lamps, as a healing application to sores, and an embrocation in the treatment of rheumatism. In Ceylon, the oil is used for various diseases in cattle and also against rheumatism. The oil-cake contains 24.16 per cent. of protein.—Pharm. Journ. and Pharmacist, June 7, 1913, 801.

**Gaboon Woods.**—*Botanical Source.*—A. Chevalier says that the export trade in timber from Gaboon has increased very greatly during recent years, yet the botanical source of most of the woods has hitherto been unknown. For some years the tree producing Okoumé wood, which is much esteemed, has been named *Aucomea Klaincana*. The logs of this burseraceous wood are often mixed with those of an *Eriodendron*, which considerably depreciates its value, as the latter wood has not the same characters. Okoumé wood is imported chiefly into Germany, where it is used for making cigar boxes. Gaboon coral wood was formerly exported in large quantities for use as a dye wood in place of logwood. It is derived from *Pterocarpus soyauxii*. Gaboon ebony is a very fine wood, which does not appear as yet to be duly appreciated in Europe. It is furnished by the ebenaceous tree, *Diospyros eula*, of which the flowers are not yet known. When these are received, it may prove that this is identical with *Diospyros flavescens*, Guerke.

The wood of young trees is quite white. The heartwood becomes black only when the trunk attains a diameter of about 12 to 18 inches. Gaboon mahogany is known to the natives as Amanguila. It is produced by a species of *Khaya*, probably *Khaya Klainei*, and is very near to, if not identical with, *K. ivorensis*, A. Chev., the source of Ivory Coast mahogany. —Pharm. Journ. and Pharmacist, June 7, 1913, 801; from Compt. rend. 156 (1913), 1389.

**Pharmacognosy.**—*Development.*—Dr. L. Rosenthaler of the University of Strassburg, during his post-graduate lectures before the Apothecaries Society of Lorraine, gave a very interesting account of the development of pharmacognosy. He went into the history of pharmacognosy and the various periods of its development. Among the numerous pharmacognosists and their special work, the following is abstracted: C. Hartwich on Drugs, O. Tunnmann on Microsublimation, Siedler and Juettner on Insect Powder and Oil of Roses, Kobert and Focke on Physiological Assays, Kraft, Barger, Dale and Tanret on Digitalis and Ergot, and last but not least, Tschirch on Rhubarb and a great many other drugs. —Suedd. Ap. Ztg., 1913, No. 81 and 82. (O. R.)

**Vegetable Drugs.**—*Pharmacopæial Description.*—The fifth edition of the G. P. has devoted greater care to the description and valuation of vegetable drugs than was exercised in former editions, yet is far from satisfactory in the definition of its requirements, which are in some cases quite deficient. The firm of J. D. Riedel has therefore instituted and carried out during the past year (1912) a series of systematic investigations to serve as a foundation for more satisfactory definitions, which were published in that firm's "Berichte" of that year. These consisted in determinations of the residues of combustion, of the residue of ash after treating it with diluted hydrochloric acid, and of the extract obtained by the action of solvents. These investigations, which have been taken up also by others, have since been continued, the results being tabulated in the firm's "Berichte" of 1913. The solvents selected were as nearly as practicable those directed in the G. P. V or the "Ergänzungsbuch of the Ger. Apoth. Ver." for preparing the tinctures and other fluid preparations; or, in cases of drugs from which no official galenical preparation is prescribed, the extractions were made with solvents which in the judgment of the investigators appeared most suitable for the valuation of the drug.—Pharm. Ztg., lviii (1913), No. 27, 267.

**Phytochemical Notes.**—*Bibliography.*—Preceded by a com-



prehensive review of the work done in phytochemical research during the past twenty-five years, into which he was initiated by his teacher and friend, Dr. Frederick B. Power, who preceded him as professor of pharmacy at the University of Wisconsin, Professor Edward Kremers publishes a compilation of the published notes on phytochemical subjects, not so much to effect an inventory, however, but to place into the hands of student investigators of his laboratory a convenient bibliography of the work done in the University, and, more particularly, to point out to them the connecting thought that makes many of these notes the result of a deliberate plan rather than of a haphazard seeking for new isolated facts.

This list does not include the titles of articles of purely chemical investigations of plant products, such as menthol and its derivatives, citronellal and its derivatives, abietic acid, etc., some of which have grown out of phytochemical investigations. Neither are the earlier investigations of Prof. Power nor more recent investigations of Prof. R. Fischer on alkaloids included. The catalogue, therefore, is not one of phytochemical investigations of the School of Pharmacy of the University of Wisconsin, but one of the fragmentary notes published by the author or by students working under his directions. The list, given in chronological order, from 1886 to 1912, includes 78 references, which may be consulted in *Journ. A. Ph. A.*, June, 1913, 724-730.

**Drugs and Chemicals.**—*Commercial Quality on the Market during 1911 and 1912.*—Two highly interesting reports on the results of laboratory examinations of drugs and chemicals supplied on the market during the year covered by June 1, 1911, to June 1, 1912, were presented at the Denver meeting of the Association, the one by Mr. W. A. Pearson, taken from the files in the Analytical Department of Smith, Kline and French Co., the other, comprising about seven thousand shipments of drugs and chemicals, compiled by Mr. A. Engelhardt from the files of Sharp and Dohme. By the limitation of time these reports are of course no longer applicable to current conditions, but they are interesting from an historical point of view, and are therefore well preserved in the *Journal of the Association* for consultation and reference. It is interesting, moreover, to note that, as previously pointed out by Mr. Engelhardt, the Pure Food and Drugs Act has exerted a beneficent influence on the drug market, inasmuch as only a very few lots (of chemicals) were found which were unfit for use. Not one lot was received which was greatly adulterated, those chemicals



which were rejected being carelessly manufactured. Regarding vegetable drugs, Mr. Engelhardt says that those submitted were less satisfactory, as may be seen from the limited list that is mentioned in his report—this limited list, however, embracing mainly drugs of medicinal and pharmaceutical importance. A similar experience is noted in the report of Mr. Pearson, in which a considerably larger variety of drugs and chemical products is mentioned. The two reports appear in the *Journ. A. Ph. A.*, February, 1913, 157-165.

**Biologic Products.**—*Immunity Produced by Them.*—C. M. Twining treats the subject of immunity produced by biological products very thoroughly. He describes the different kinds of human immunity, and how the biologic products develop action to produce immunity in the human system. He concludes his instructive paper as follows: "Those pharmacists who desire to place themselves in a position to suggest types of biologic products and their doses when called upon by their physicians to do so, should obtain good understanding of the principles of immunity involved in their action on the patient, which is not only gained by a little study but which will be found very interesting indeed."—*Proc. California Phar. Assn.*, 1913, 22-26. (E. C. M.)

**Biologic Assay of Drugs.**—Dr. Wasicky recommends the biologic assay of the following drugs: squill, digitalis, convallaria, adonis, ergot, conium, lobelia, aspidium, strophanthus, hydrastis, aloe and the saponin drugs, senega and quillaja. He recommends the adoption of some biologic assays for inclusion into the *Pharmacopœia*.—*Ztschr. Allg. Österr. Apoth. Ver.*, 1913, No. 15. (O. R.)

**Biologic Assay of Drugs and Poisons.**—Similar to the lectures of Prof. Dr. Heffter in his post-graduate course at the Berlin University, Dr. F. Flury urges the necessity of biologic assays for drugs, poisons, sera, organic preparations, digitalis, ergot, etc. He gives details regarding the biologic assay of digitalis and the drugs containing saponin, and claims that such assays will be of great benefit to the science and practice of pharmacy. Although these biologic assays will never entirely replace the chemical assays, they will, nevertheless, undoubtedly be helpful to corroborate the latter.—*Pharm. Prax.*, 1913, No. 1. (O. R.)

**Foods and Drugs in 1912.**—A number of abuses still exist in the drug market. It happens too often that actively poisonous substances are dispensed by druggists who neglect to affix a

poison label. It is an easy matter for a perfect stranger to purchase the dangerous habit-forming diacetyl-morphine (heroin) without a prescription, so that some cities have passed an ordinance forbidding its sale except on prescription or for purely professional or scientific purposes. Among more familiar products turpentine is found to be extensively adulterated, especially with mineral oil.—J. Am. M. Assoc., v. 60, 132-133. (M. I. W.)

**Limited Materia Medica.**—Bernard Fantus says that we have been laboring for some time under the great disadvantage of having to teach too many drugs to our students in order to prepare them for state board examinations, as many of you know. Considerable thought has been expended on the proper list of drugs, a knowledge of which might properly be demanded by state boards from candidates. It seems, however, that these lists have not yet been adopted to any great extent, and it is hoped, and it seems may be hoped very reasonably, that "Useful Remedies" may fill the need of giving us a syllabus to which we should hold our students as perhaps a minimum requirement and which the state boards might be asked to adopt for the preparation of their examination questions.—J. Am. M. Assoc., 1913, v. 61, 7. (M. I. W.)

**Materia Medica.**—W. J. Wulling says the average text-book on materia medica includes too many obsolete drugs. A few well-selected drugs will answer all purposes of therapeutics, and the tendency which is toward that end is commendable despite the fact that up to the present time little progress has been made.—J. Am. M. Assoc., 1913, v. 61, 7. (M. I. W.)

**Drugs.**—*Their Value.*—Oliver T. Osborne says a thing that has no therapeutic value should not be termed a drug and useless things should not appear in the Pharmacopœia, as being of value.—J. Am. M. Assoc., v. 60, 2039. (M. I. W.)

**Medicinal Drugs.**—*Review of Recent Marked Results from Their Use.*—Hanauer publishes a review of recent work on medical and general uses of drugs citing the value of apocynum as a heart tonic; the remarkable healing action of an infusion of symphytum for ulcer of the breast, probably due to the allantoin which it contains; the employment of soya beans as a food; the introduction of a new remedy for diarrhœa from equatorial Africa, called uzara root and the so-called "ozoflieric" baths, which are made from a dry extract of pine needles to which has been added the requisite

quantity of the oil from the needles. *Schweiz. Wschr. f. Chem. u. Pharm.*, 51 (1913), No. 31, 453. (H. V. A.)

**Useful Remedies.**—Ralph St. J. Perry thinks it would be a good idea if the Council on Pharmacy and Chemistry could send a copy of "Useful Remedies" to every examining board in the United States and insist on their using it. Many physicians think the object of the council is to prohibit or limit their prescribing. It is not; they can prescribe any remedy that they want to. The Council acts in an advisory, not mandatory, capacity. If the physicians of the country understood this, they would have kindlier feelings toward the Council.—*J. Am. M. Assoc.*, 1913, v. 61, 8. (M. I. W.)

**Drugs Sold to Dispensing Physicians.**—W. A. Puckner reports a comprehensive investigation on the quality of drugs sold to dispensing physicians and concludes that the examinations reported show that the random charge of sophistication and adulteration which has been repeatedly made against "physicians' supply houses" is unjustified. The examination does show, as has been argued before, that standard drugs are likely to be of fair quality irrespective of the source from which they are obtained.—*J. Am. M. Assoc.*, 1913, v. 61, 855-859. (M. I. W.)

**How to Secure Reliable Drugs.**—Oliver H. Howe observes that while the modern drug store may be a social necessity as a general emporium of all sorts of small wares and ready-made medicines, for confectionery, cigars and fancy articles, it cannot and should not be relied upon as a source of reliable medicines. The well-equipped and conscientious druggist who has a high standard of work and lives up to it should be encouraged. No physician should jeopardize his patients or his own reputation by relying on a prescription service which he knows to be poor. If necessary, he should provide and dispense his own medicines.—*J. Am. M. Assoc.*, 1913, v. 61, 1392-1393. (M. I. W.)

**Carelessness in Pharmacy as a Reason for a Restricted Materia Medica.**—M. I. Wilbert expresses the opinion that the immense number of articles of a medicinal character carried in stock by the retail druggist, even if all his time and the time of his employees were devoted to the study and care of these articles, would make it practically impossible to exercise the degree of supervision and care in testing that is theoretically required by the Pharmacopœia of the United States. Under present-day conditions practically



no check is exercised in the pharmacy over drugs, chemicals or galenical preparations, and despite any care that may be exercised at the time of making, to adjust preparations to established standards, considerable change may have taken place in the composition of these preparations before they finally reach the consumer.—J. Am. M. Assoc., 1913, v. 61, 189–191. (M. I. W.)

**Inferior Drugs.**—The House of Delegates of the American Medical Association endorsed the following resolution:

WHEREAS, It has been repeatedly shown by the Council on Pharmacy and Chemistry, and by the Chemical Laboratory of the A. M. A., as well as by other investigators, that many drugs and preparations used in the treatment of disease are of unreliable composition, through carelessness, negligence, ignorance and other reasons; and

WHEREAS, This condition of affairs is against the interests of public health and the progress of the science of medicine; therefore it is evident that greater activity is needed in the enforcement of existing laws relating to drugs and medicines; therefore, be it

*Resolved*, That the Section on Pharmacology and Therapeutics request the House of Delegates of the A. M. A. to bring this matter to the attention of the proper federal and state authorities, and urge on them the need for more energetic and effective action in this direction.—J. Am. M. Assoc., v. 60, 2086. (M. I. W.)

**Drug Deterioration.**—W. J. Wilson, Jr., presented the following report to the Wayne County (Michigan) Medical Society:

The Committee on Drug Deterioration appointed by the joint meeting of the Detroit Retail Druggists' Association and Wayne County Medical Society would respectfully report:

Recent investigations of the fluidextracts show that with few exceptions they retain their potency for a number of years when kept under proper conditions; that is, without access to air, or exposure to light.

With such drugs as hydrogen peroxide in which the absolute limit of potency is eighteen months, and the probable limit from six to twelve months, we would recommend that the manufacturers state on the label the date of manufacture as well as the limit of potency.

We would recommend that the practice of keeping all liquid preparations, such as tinctures and fluidextracts which deteriorate on exposure to light, preferably in light-proof cupboards, or in amber-colored bottles not exposed to direct sunlight, with the usual pre-



cautions of a tight-fitting and air-proof stopper, be made universal.

We would also recommend that the subject of drug deterioration be made one of the leading topics for discussion in the meetings of all state and national pharmaceutical and medical societies in the near future.—J. Am. M. Assoc., v. 60, 1810. (M. I. W.)

**Drugs.**—*Effect of Temperature on Their Activity.*—Dr. Burmann reports assays of five drugs—Colchicum, Digitalis ambigua, Digitalis purpurea, aconite and belladonna during the five years (1907-1911) that he has been collecting these drugs in Switzerland. He compares his assays with the average temperature of the year of growth and decides that the alkaloidal (or glucosidal) strength of each of the five drugs is directly proportional to the average temperature.—Schweiz. Wschr. f. Chem. u. Pharm., 51 (1913), No. 9, 117 (H. V. A.)

**Progress in Medical Education.**—Henry S. Prichett, in a review of recent medical education, compares European and American medical schools, points out the need of educational sincerity, deplures unfortunate optimism in weak schools, calls attention to some striking examples of unevenness and recommends that the trustees of the Carnegie Foundation undertake at an early date the study of dental education and dental training and also a study of the training for pharmacy. There is at present much confusion on both of these subjects, both of which are closely related to medicine, though standing on far different bases and demanding qualities of widely differing order. The matter of hospital relations is also one that urgently demands a fair statement of the existing facts before a wide-spread improvement can be hoped for.—J. Am. M. Assoc., v. 60, 743-747. (M. I. W.)

**The Teaching of Therapeutics.**—Ray Lyman Wilbur says Pharmacology has gained a firm hold in medical instruction. It must not fail to extend its domain to the bedside, to become a part of the life of each and every teaching clinic. It must be taught so that dog experiments will be seen from the viewpoint of man rather than that drug effects on man shall be looked at primarily from the standpoint of the dog. Drugless healing is a reproach to medicine. It should never have come into being as an entity. We should not be so associated with bottles and evil doses that the prescription is recognized generally as the badge of the profession.—J. Am. M. Assoc., 1913, v. 61, 525-526. (M. I. W.)

**Drug Journals.**—*High Class and Otherwise.*—The “patent-medicine” curse stands in the same relation to pharmacy as the “ethical proprietary” evil to medicine. The “proprietary” encourages unscientific prescribing and careless diagnosis on the part of the physician; the “patent medicine” leads many druggists to assume the functions of the physician and to prescribe for diseases of which they are ignorant. Fortunately there are signs of better things in both professions. As the more enlightened physicians, with the aid of the better medical journals, are striving to remove the blight of the proprietary evil, so the better class of pharmacists with the cooperation of a few high-grade drug journals are doing their best to abolish the “patent-medicine” curse.—J. Am. M. Assoc., v. 60, 837. (M. I. W.)

**“Kur” and “Cure.”**—Many newspapers are hasty or careless in the translation, particularly of German words. For instance, the German word *Kur* does not mean “cure,” although it is not an uncommon thing to find it so translated into English. “To cure” in English means “to restore to health; to effect a cure;” but in other languages it means merely to apply a “method of remedial treatment of disease; medical or hygienic care; method of medical treatment.” The German word for “restoration to health” is *Heilung*, not *Kur*. The Latin word *cura* means merely “care,” a shade of meaning which is preserved in the derived term “curator.”—J. Am. M. Assoc., v. 60, 1308. (M. I. W.)

**Numerical Superstitions in Medicine.**—F. Berger gives an interesting historical review of the superstitions regarding numbers, notably 3, 7, 9 and 13, not merely in folk medicine, but also in every-day life.—Schweiz. Wschr. f. Chem. u. Pharm., 51 (1913), Nos. 19 and 20, 274 and 278. (H. V. A.)

**Hemostatics and Vulneraries.**—*Historical Facts Regarding Their Use.*—F. Berger published an interesting historical article on this type of medicaments, describing the various substances used by the ancients, the primitive peoples of the present day and in folk medicine. The list includes a great number of agents, animal, vegetable or mineral, nor are talismen and invocations missing.—Schweiz. Wschr. f. Chem. u. Pharm., 51, Nos. 36, 37, 38 and 39, 533, 549, 565 and 581. (H. V. A.)

**Poisons and Habit-Forming Drugs.**—The legal enactments which have to do with the control and sale of opium and cocaine in the several states, show that there is a most extraordinary

lack of uniformity in the requirements in different parts of the country. Thus, in many states anti-narcotic laws are so comprehensive that were an attempt made to enforce the law literally it would result in the fine or imprisonment of practically all the retail druggists. On the other hand, there are some states in which the exceptions and provisions of the law are so numerous as practically to nullify all efforts to control the traffic in narcotic drugs.—J. Am. M. Assoc., v. 60, 1363. (M. I. W.)

**Toxicological Notes.**—Hanauer publishes an interesting paper on recently reported cases of poisoning. In Hamburg, the most frequently used poison since 1904 has been lysol, while up to 1893 phosphorus had been the "popular" poison.

Among other cases of poisoning cited were those produced by acetanilid; oil of mirbane; potassium permanganate; 20 Gm. of laudanum at one dose; cantharides; aluminum acetate and cinnabar, the latter being interesting since it was noted in a young artist who inhaled particles of the pigment while at work in her studio.—Schweiz. Wschr. f. Chem. u. Pharm., 51 (1913), No. 32, 473. (H. V. A.)

**Patent Medicines.**—One of the many remarkable phenomena that have been brought to light by the propaganda against fraudulent "patent medicines" is the difference in the degree of interest shown by the layman as compared with the relative indifference exhibited by the medical profession. In its fight against fraud in medicine during the last six or eight years, the Journal has been supported much more vigorously by lay publications than it has by medical journals. Hardly a day passes that a letter is not received from some newspaper or magazine enclosing the "copy" for an advertisement of some medicinal product with the request for an expression of opinion as to the objectionableness or admissibility of such advertisement.—J. Am. M. Assoc., v. 60, 134. (M. I. W.)

**Patent Medicines.**—Some remarkable disclosures were made at the last sitting of the committee appointed by the government to investigate the sale and advertisement of nostrums. The attention of the committee had been called to a series of advertisements, in popular magazines, of preparations. The advertisements took the form of recommendations of these goods by a number of women. These recommendations were sometimes given in the form of answers to correspondents, and sometimes



without request for information having been received.—J. Am. M. Assoc., v. 60, 1970. (M. I. W.)

**Patent Medicines.**—Attention is called to new rules for the acceptance of medical advertising adopted by the New Orleans "Item." This paper refuses to accept advertising for: 1. Books, pictures, "rubber goods," or other devices of a questionable nature. 2. Medicines or methods for the cure or relief of diseases peculiar to women. 3. Medicines, methods, or devices for the cure or relief of diseases peculiar to men. 4. Medicines or mechanical devices that purport to "enlarge the bust," or to "improve the figure." 5. Any medicine that claims to cure or relieve diseases commonly held by medical science to be incurable in this way. 6. Any medicine that claims to cure or relieve any disease or injury whatever. 7. Any medical treatment offered free. 8. Advertisements leading to correspondence between advertiser and reader in which the principle of these rules is violated. 9. Any medicine containing a habit-forming drug. 10. Medicines containing useful drugs or chemicals that are potentially dangerous when indiscriminately administered.—J. Am. M. Assoc., 1913, v. 61, 1301, 1313. (M. I. W.)

**The Solicitude of Patent-Medicine Men.**—John Lawson, manager of an English "patent-medicine" house in a hearing before the Select Committee on Patent Medicines, of Parliament, at present in session in Great Britain, testified that in his opinion it was "not desirable in the public interest that the presence of acetanilid and similar drugs should be declared on the labels of proprietary medicines." His reason was that "such decisions would show the public that acetanilid was the usual remedy for headache," with the result that persons of a saving turn of mind would be tempted to buy it by the ounce and do their own dispensing.—J. Am. M. Assoc., v. 60, 1466. (M. I. W.)

**Patent Medicines.**—The psychology of objectionable nomenclature would furnish a readable story. The A. D. S. Preparations bear the usual statement: "This is not a patent medicine," leading chemists to inquire whether a preparation made by a druggist or a group of druggists may not be quite as much a "patent medicine" as if made by a quack doctor or a seemingly reputable house.—J. Am. M. Assoc., v. 60, 133. (M. I. W.)

**The Council on Pharmacy and Chemistry.**—The constructive work of the Council on Pharmacy and Chemistry of the American



Medical Association is becoming more prominent, as manifested in the improvement of preparations already on the market and the check exercised on the output of new medicines.—J. Am. M. Assoc., v. 60, 58. (M. I. W.)

**The Council on Pharmacy and Chemistry.**—Torald Sollmann, under the caption "Yesterday, To-day and To-morrow," discusses the activities of the Council on Pharmacy and Chemistry of the American Medical Association, believing as he does that the present activities of the Council can be appreciated by the medical profession only in the light of its history and with some indications of its activities in the future.—J. Am. M. Assoc., 1913, v. 61, 5-7. (M. I. W.)

**Objection to Prescribing Proprietaries.**—The real objections to the prescribing of proprietaries are those based on considerations of public health and scientific medicine. But there is an economic phase to the question, too. "If you prescribe Antikamnia, Cystogen or Purgen and your patient feels better or gets well," said an old druggist to a young practitioner, "the patient will be a walking advertisement for the respective proprietaries. If, on the other hand, you prescribe acetanilid, hexamethylenamin or phenolphthalein, in the form of a regular prescription, he will recommend the prescriber—you—to his best friends."—J. Am. M. Assoc., v. 60, 1378. (M. I. W.)

**Bulletin of New Chemicals.**—H. Golaz presents a paper pointing out the multiplicity of new remedies and the paucity of information concerning them. He urges the Swiss pharmaceutical societies to demand of the manufacturers that they furnish with each package of the chemical a bulletin showing the chemical synonym, one or two tests of identity, melting (or else boiling) point, solubility, special incompatibilities, dose and suggestions as to preservation and sterilization.—Schweiz. Wschr. f. Chem. u. Pharm., 51 (1913), No. 44, 667. (H. V. A.)

**Patent Medicines.**—All "patent medicines" containing poisonous drugs should be required to be labeled "poison." The protective actions of such an amendment would soon be demonstrated. In Great Britain, where there is such a legal requirement, preparations like Winslow's Soothing Syrup, containing such insidious poisons as morphine, have to be labeled "Poison." As the result, the Winslow concern has taken the morphine out of its British product and has substituted a drug that is not listed

in the schedule of poisons. But Winslow's Soothing Syrup still goes to American babies with its deadly morphine. The value of the requirement lies in the fact that the word "Poison" has a very real and definite meaning to any person that reads English. The same cannot be said of the chemical names for various poisons. Thus the most ignorant of mothers would hesitate to give her child a "patent medicine" that was labeled "Poison," but she would pay little attention to the statement that it contained morphine, for instance. The weakness of the present federal law has been referred to many times. As the law now stands, "patent medicines" may go to the public containing such deadly poisons as strychnine, atropine, prussic acid, arsenic, etc., with no warning or hint of the presence of these drugs.—J. Am. M. Assoc., v. 60, 1547. (M. I. W.)

## B—VEGETABLE DRUGS

(Arranged in the order of their Botanical Source.)

### FUNGI.

**Ergot and Its Preparations.**—*Critical Review of the Requirements of the B. P.*—F. H. Carr and H. H. Dale, at the 1913 meeting of the British Pharmaceutical Conference, presented a comprehensive critical review of the B. P. requirements for ergot and its preparations. They say that, until the last few years, the chemistry of ergot, and especially of its active principles, has been so obscure and confused that the preparations representing this drug in the various pharmacopœias have necessarily had a traditional rather than a scientific sanction. Now, however, that the chief active principles of the drug have been isolated in a state of chemical purity, the constitution of these compounds in some instances confirmed by synthesis, and the mode of action of each worked out in full detail, it seems opportune to submit to the test of this new knowledge the pharmacopœial requirements for the drug and its preparations; and making use of the evidence now available, the authors feel justified in drawing the following conclusions, and in endeavoring to make them the basis of a rational criticism of the current pharmacopœial preparations, instructions and requirements:

(1) Ergotoxine is the essential active principle of ergot, and is capable by itself, in suitable doses, and when given by intramuscular injection, of producing the true therapeutic effect of ergot. The proportion of available ergotoxine present in a sample of ergot

should be the guide to its suitability for pharmaceutical use. Preparations should be designed to extract all the ergotoxine from the ergot and retain it in stable solution.

(2) The active amines have individually an important stimulant action on the muscular wall of the human uterus; this is especially the case with "Ergamine." Their presence in ergot extracts, however, owes its chief importance to their adjuvant and synergistic effect on the action of ergotoxine. Given equal ergotoxine values, an ergot which also contains a high proportion of amines will be the better.

Basing their elaborate criticism following, upon these conclusions, the authors recommend a revision of the B. P. monographs on ergot and its preparations, in the following lines:

1. The use of ergots other than that growing on rye should be officially sanctioned, provided that an acceptable method of standardizing for active alkaloid can be found.

2. The present *Extractum Ergotae* (Ergotin) should be abandoned. If a soft extract is needed, the extraction should be carried out with 60% alcohol, and to this citric acid should be added instead of hydrochloric. The acid might with advantage be added to the alcohol before the extraction is performed. Such a product could be evaporated to a soft extract without filtration, and would contain practically the whole of the active constituents of the ergot.

3. The present *Extractum Ergotae Liquidum* should be abandoned, and the fluidextract of the U. S. P. adopted in its place. If there is any reason for including an aqueous extract of ergot, weak acetic acid should be employed in place of water for the maceration.

4. The *Injectio Ergotae* might be abandoned. The Pharmacopœia should include suitable salts of ergotoxine, which might be injected alone or with suitable proportions of active amines.

5. A satisfactory tincture could be made with 60% alcohol, *without ammonia*; but the adoption of the U. S. P. fluidextract would make this inclusion unnecessary.—*Trans. Brit. Pharm. Conf. (Yearbook of Pharmacy), 1913, 505-512.*

**Ergot.**—*Physiological Tests.*—Crawford and Crawford discuss the cock's comb test for the activity of ergot preparations, report a number of experiments with the ergot amines and point out that until we know more of the therapeutic value of the ergot constituents and in what relative proportions they should occur, the question as to whether or not we shall standardize for ergotoxine



alone cannot be satisfactorily answered.—J. Am. M. Assoc., 1913, v. 61, 19-23. (M. I. W.)

**Ergot.**—*Alkaloidal Content.*—T. Dahlin examined ten samples of ergot which were collected at different seasons and which have been kept for a variable length of time. The alkaloidal content of these samples varied from 0.05 to 0.17 per cent. The experiments of the author prove that ergot is most active before the rye is ripe and also that when properly kept the content of cornutin does not diminish.—Apoth. Ztg., 1912, No. 102. (O. R.)

**Brewer's Yeast.**—*Utilization as a Food Product.*—Dr. H. Serger contributes an interesting compilation of the experiments and endeavors that have been made to utilize the immense surplus of yeast that is produced in breweries, amounting in Germany alone to 70,000,000 Kgm. annually according to F. Hayduck. The possibilities of utilization consist: (1) of the direct use; (2) of the conversion into dry yeast; (3) of its conversion into extract. For any of these purposes the yeast must first be deprived of the bitter substance derived from the hops used in the brewing, which may be done in various ways. According to one authority, this is best accomplished by treatment with cold soda solution; another consists in washing the yeast with cold water, then stirring it with a solution of borax and soda at 30° to 35° C., adding more borax with continual stirring until the yeast settles as a white mass which is collected on a strainer and thoroughly washed with water; while a third method consists of successively washing the yeast, with acidulated water (25.0 Gm. of tartaric acid in 100 liters), with 5% sodium chloride solution, and finally with pure water.

Of the three different uses that may be made of the bitterless yeast, all of which have been applied in practice to a limited extent, the conversion into an extract suitable as a food product apparently offers the most promising outlet for utilizing the surplus yeast produced. Among the numerous opinions cited by the author, the following, although possibly too optimistic, offers suggestions that deserve attention and may eventually lead to a solution of the question of profitably utilizing a commodity which hitherto has gone to waste. The author quoted, who is an authority on the subject, asserts that yeast extract prepared in accordance with the best methods, has been pronounced by scientific experts to be the equal in every respect of the best meat extracts, and superior to meat extracts of inferior quality, both as regards taste and nutrient value. Unfortunately this was not appreciated un-



til too late, and now that the high price of meat extracts has again focused attention to yeast extract as a substitute for meat extracts, the manufacturers of yeast extracts have long been forced to close their factories, with the sacrifice of their costly equipment, for the want of the patronage which they deserved. Very recently manufacturers and dealers in yeast extract have again appeared on the market, but the product supplied by them cannot be accepted as the equal of good meat extracts or even of good yeast extract such as was offered on the market in former years.—Pharm. Ztg., lviii (1913), No. 26, 256.

## LICHENES.

**Cudbear.**—*Preparation of an Extract of Uniform Tinctorial Power.*—One of the most perplexing problems that has confronted the Committee on the National Formulary is the preparation of a solution or tincture of cudbear possessing uniform tinctorial power, so that in the hands of different operators with such materials as might be available in the market, identical, or practically identical, tints might be imparted to liquids—elixirs, syrups, solutions, etc.—to which the coloring fluid is added in definite proportions. This question has been in the hands of a sub-committee, of which Mr. H. V. Army is the chairman, for quite a number of years and has elicited a number of interesting papers, both from the members composing the sub-committee and of others who have become interested in the subject, which have appeared from time to time without, however, leading to a wholly satisfactory solution of the problem, as is outlined in an admirable paper communicated by Mr. Geo. M. Beringer to the New Jersey Pharmaceutical Association in 1912. (See Year Book 1912, 134.)

Inasmuch, however, that no definitely reliable conclusions have been reached, Mr. Army, giving proper credit to his collaborators on the subject, communicates the results of a series of experiments which, if followed up, seem calculated to assure a practical solution of the problem. At a previous meeting of the Association (1911) it had been suggested that uniformity of tinctorial power might be secured by preparing extracts of cudbear, either with alcohol or with acetone—the latter being suggested by Mr. Gardner. Following up this suggestion with different commercial samples of cudbear, Mr. Army found that the extracts prepared with alcohol contained appreciable quantities of sodium chloride and that in consequence they varied very considerably in tinctorial power, the strongest showing five times the power of the weakest. The acetone extracts, suggested by Mr. Gardner, were more uniform; but

here also the weakest had only two-thirds the coloring power of the strongest. If, however, the cudbear was first extracted with chloroform, which dissolved none of the purple-red pigment, a mahogany-brown pigment was extracted, and the resultant acetone extracts obtained from four specimens of cudbear were practically uniform in tinctorial power. The method may also be applied to the alcoholic extract of cudbear, treating this with chloroform to exhaustion, then extracting the residue with acetone, distilling off the latter to a thin extract and drying this by "scaling."

The extract so obtained, by either method, is soluble in water containing ammonia and in alcohol, and a faintly ammoniacal-alcoholic tincture is freely miscible with water. The tinctorial power of this extract is approximately three times that of a straight acetone extract and about 300 times that of an average sample of tincture of cudbear, N. F. As to uniformity, six samples of these extracts in a dilution of 1 : 40000 were practically identical in tint and intensity. Of these six extracts, three were prepared by making an alcoholic extract, removing the brown pigment from this by maceration with chloroform and extracting the residue with acetone. The "scaled" extracts obtained in this way differed in no respect from the other three, and preliminary extraction with alcohol is therefore superfluous. —Journ. A. Ph. A., January, 1913, 47-51.

**Cudbear.**—*Preparation of the Red Coloring Principle.*—Mr. Alexander Gardner, referring to a preliminary paper on cudbear which was discussed by him and Mr. Otto Raubenheimer at the Boston meeting of the Association, mentions that the process of preparing the red coloring matter recommended at the time was afterwards abandoned, owing to the amount of wax extracted by the acetone with the pigment, which made it undesirable. Experiments since made by Mr. Gardner have, however, developed a cheap process, which is at the same time very simple, while the product, which he has designated as

"Persionin," possesses absolutely uniform tinctorial power as obtained from different commercial samples of cudbear. The process consists in percolating the cudbear with purified petroleum ether until free from wax, then drying the drug, repacking it in a percolator and percolating it with acetone to exhaustion—about 2500 Cc. being required for 1000 Gm. of cudbear. The acetone is recovered by distillation, the residual extract heated for 30 minutes to 210° F. in a porcelain capsule, then pulverized and placed

in a sulphuric acid desiccator for three days, during which it loses about 25% of its weight.

So obtained, "persionin" is a black, lustrous powder with an aromatic odor, soluble in alcohol, glycerin, chloroform, ether, and hydro-alcoholic liquids, but is only sparingly soluble in water. Five different lots of cudbear yielded, respectively, 6.5, 7, 6, 5, and 5.5% of persionin. Each sample of "persionin" was tested by dissolving 1 : 100 in alcohol and glycerin in 3 (2 Rep.). One Cc. of this were added to 99 Cc. of distilled water, and in each particular the color was the same.—Journ. A. Ph. A., January, 1913, 51-52.

#### GRAMINACEAE.

**Maize-Ensilage.**—*Volatile Products Evolved by the Process.*—"La Nature" (March 29, 1913) says that in a great many agricultural districts, the forage for cattle consists of "maize-ensilage" which is preserved in silos, these being constructed by making deep cavities in the ground, in which the material is pressed down and covered up with earth to protect from contact with the air. Fermentation takes place, during which there are formed substances which give to the feedingstuff a peculiar flavor, much relished by the animals to which the material is fed during the winter months, when the ordinary feedingstuffs are scarce. The fermentation which takes place has been studied to some extent, and it has recently been noted that during the ensilage of maize there are formed the following volatile acids: 17 per cent. formic acid; 75 per cent. acetic acid; 8 per cent. propionic acid; and 0.6 per cent. of butyric acid. Other volatile products are alcohols containing 21 per cent. of methyl alcohol, 7 per cent. ethyl alcohol, and 7 per cent. of propyl alcohol; but apparently no ethers were found.—Pharm. Journ. and Pharmacist, April 26, 1913, 593; from Journ. de Pharm. et Chim., April 16, 1913.

**Rice.**—*Direct Determination of Talc-Facing.*—E. W. T. Jones recommends the following direct method for the determination of talc-facing on rice—an operation which is simple and expeditious, and is independent of any variation in the natural ash of the grain: Five grams of the rice are placed in a 150 Cc. squat beaker and 20 Cc. of ether poured in, the mixture being agitated for a few minutes. The liquid is then poured off into an 80 or 100 Cc. beaker containing about 1 Cc. of water, and the ether evaporated. The ether is now evaporated from the rice, and 15 Cc. of cold distilled water added, with agitation; the liquid is poured off into the other



beaker, and this repeated four or five times until the water comes away almost clear; these washings are allowed to stand over night, the clear supernatant liquid poured off, leaving the talc associated with a little fine rice behind; this is transferred by means of a wash bottle (using methylated spirit to facilitate evaporation) to a weighed platinum dish, evaporated to dryness, ignited, and weighed. This gives the amount of talc-facing. The first treatment with ether removes any oil which may tend to retain the facing, and the subsequent water dissolves the glucose, fixing the same.—Chem. News, October 10, 1913, 176.

**Wheat Germ.**—*Chemical Examination.*—In an exhaustive treatise read before the British Pharmaceutical Conference, 1913, Dr. F. B. Power and Dr. A. H. Salway give the details of a highly interesting chemical examination of "wheat germ," which, formerly a waste product or only used as fodder, has of recent years been utilized for its dietetic value in certain kinds of bread and other forms of food. In distinction from ordinary wheat flour, the germ of wheat appears to be particularly characterized by its high percentage of fat and high nitrogen content, and, although the present investigation was the indirect sequence of a research of phytosterol glucosides, it seemed of economic importance to make a very complete chemical examination of this material. In the course of this examination, the details of which must be consulted in the original, the authors confirmed the occurrence of sitosterol, choline, betaine, allantoin, cane sugar, dextrose, and raffinose found by previous investigators in wheat germ, but no evidence was obtained of the presence of asparagine, recorded by Frankfurt. So far as known to the authors, the nature of the fatty acids, now shown to consist of palmitic, stearic, and linolic acids, had not hitherto been determined. The amount of resinous material contained in the wheat germ is exceedingly small, representing only about 0.04 per cent. of its weight. A small amount of amorphous glucosidic material was also obtained. The occurrence of a very small amount of sinapic acid in some form of combination is of special interest, as this acid has hitherto only been known to occur in mustard seed, or at least in the family *Crucifera*. It is highly probable that the latter occurs in the same form of combination (choline ester of sinapic acid) in wheat germ.—Trans. Brit. Pharm. Conf. (Yearbook of Pharmacy), 1913, 456-466.

#### ARACEAE.

**Calamus.**—*Microchemical Reactions of Tannin-Bearing Cells.*—



Tschirch and Weber finding contradictory statements in the literature regarding the action of vanillin-hydrochloric reagent on calamus sections, studied the microchemical reactions of that rhizome in a fresh specimen, in the same after one month's maceration in water, in an 18 months' old commercial sample, and in another very old sample. Their results, presented in tabulated form, show that the reactions of potassium dichromate, of vanillin-KOH reagent, of Braemer's reagent, of 1% sodium tungstate, and of 0.05% naphthylene blue solution, were the same in all four specimens of the vanillin-hydrochloric acid; but the ferric chloride and the ferric alum reactions were quite different according to whether the rhizome was fresh or old.—Schweiz. Wschr. f. Chem. u. Pharm., 51 (1913), No. 19, 269. (H. V. A.)

## LILIACEAE.

**Cevadilla.**—*Alkaloidal Content.*—F. König found one sample of Cevadilla to contain only 1.286 per cent. of alkaloids. Inasmuch as the average content is over 3 per cent. of alkaloids, it is advisable that this seed, or its powder, should always be assayed.—Apoth. Ztg., 1913, No. 19, 174. (O. R.)

## IRIDEACEAE.

**Spanish Saffron.**—*Industrial Cultivation and Grading.*—The "Journal of the Royal Society of Arts" (July 25, 1913) gives an interesting account of the "Saffron Industry in Spain." The saffron plant has been known and valued, since the earliest times, for at least some of the many useful qualities which make of it an important article of commerce to-day, and while it is cultivated industrially at present in Egypt, Arabia, Italy, and France, it is nowhere grown on a more extensive scale or of as fine a quality as in Spain (principally within a triangle drawn between the towns of Tarragona, Segovia, and Cartagena). The plant, which it is believed was originally brought from Asia to Europe before the Christian era, is a hardy, drought- and frost-resisting one, which commercially does rather better on medium or poor than on very rich soils. It is renewed from the new bulbs formed in the fourth year of its growth. They are dug up in May, and carefully examined to see that they are perfect in form and contain no signs of bruises or attacks of disease. Their outer skin is removed before planting and the bulbs sprinkled with water, as fine particles of earth stick to them and aid in conserving their moisture. Bulbs about as large as medium-sized Spanish chestnuts are the best. The bulbs are planted about 10 inches deep, and as each year

new bulbs are formed above the original ones, which die out as the new ones develop, they each year grow nearer to the surface of the soil, until the large cluster which forms makes it impossible for the new bulbs to properly develop; hence the necessity of digging them up and replanting within a cycle of 3 or 4 years. As regards the selection of plants, the United States Consul at Malaga says that the color of the drug sought is a brilliant, intense dark red, the odor pungent, and the pistils long and thick. Saffron is graded in Spain according to color as "select," "superior," "good," and "ordinary," and according to odor as "pure," "aromatic," "excellent," "good," and "ordinary." The origin of its name is the Persian word "*zafaran*," to which the Arabians added the prefix "*al*," which was adopted in the eighth century by the Spanish as "*alzafran*," but has since been modified in Spain to the present name "*azafran*," and in English and other languages to derivatives of the same origin.—Pharm. Journ. and Pharmacist, August 23, 1913, 321.

**Spanish Saffron.**—*Presence of Boric Acid in the Ash.*—A. Verda, chemist of the Canton of Lugano, found a sample of Spanish saffron yielding 3.2 per cent. of ash giving a marked reaction for boric acid. Separating the larger particles from the pulverulent portion of the sample he finds that the powder yielded 7.17 per cent. of ash, of which 2.2 per cent. was insoluble in hydrochloric acid. He doubts, however, whether the borate is present as an adulterant, since it seems unlikely that a sophisticator would add so small an amount as he found.—Schweiz. Wschr. f. Chem. u. Pharm., 51 (1913), No. 42, 631. (H. V. A.)

**Saffron.**—*Boric Acid a Natural Constituent.*—R. Krzizan observes that while borax is a frequent adulterant of saffron, the detection of boric acid in the drug is not necessarily evidence that this has been added as an adulterant, since saffron may naturally contain boric acid, though only in very small quantities. A series of experiments made with different samples of pure unadulterated saffron has convinced him that unless the reaction of the saffron ash upon curcuma paper is pronouncedly strong, it is not safe to conclude that it is due to adulteration with borax, since many of the samples of genuine saffron examined gave a distinct though faint reaction with curcuma.—Pharm. Ztg., lviii (1913), No. 42, 416; from Ztschr. f. öffent. Chem., 1913, No. 5.

**Saffron.**—*Adulteration.*—J. Bullier reports the results of examination of numerous samples of saffron offered on the market,

and found 97 per cent. of them adulterated. In most instances the adulterant proved to be reducing sugar, amounting to from 23.5 to 40 per cent., calculated as invert sugar. In such samples, the percentage of ash was correspondingly less than in normal saffron, ranging from 2.7 to 2.13 per cent., although in other samples containing sugar the ash content was nearly normal—from 5.5 to 6.5 per cent.; but in these cases the saffron had also been weighted with inorganic salts, either borates or sulfates. About 10 per cent. of the samples were weighted with saccharose to the amount of 10 to 18 per cent. In a few samples, all derived from the same foreign firm, formaldehyde was detected, and these were uniformly weighted with glycerin.—Pharm. Ztg., lviii (1913), No. 64, 631; from Ztschr. f. Unters. d. Nahr. u. Genussm., 26 (1913), No. 1.

**Saffron.**—*Falsifications.*—Gehe & Co. direct attention to several recently observed falsifications of saffron. According to Wasiky, the flowers of *Onopordon acanthium* are employed for this purpose, the presence of which is readily recognized under the microscope; while, similarly, the over-ground portions of a *Papilionaceæ* have been recognized as adulterants of Spanish saffron by Nestler, who mentions further that it was weighted with barytes and colored with carmine.—Pharm. Ztg., lviii (1913), No. 33, 328; from Gehe & Co., Handelsbericht, 1913.

**Saffron.**—*Detection in Confectionery.*—C. Martini recommends the following method for the detection of saffron in confectionery: The material is finely powdered and extracted by maceration with cold 70% alcohol with frequent agitation during 24 hours. The extracted residue is dried, then powdered, and 50 Gm. of it boiled for 15 minutes in 100 Cc. of 70% alcohol under a reflux condenser on the water bath; the liquid filtered off, and the residue again boiled with fresh alcohol; the united extracts concentrated in the water bath, and exhaustion completed with ether. The extract, after evaporating the ether, is boiled with 98 per cent. alcohol, and the latter solution evaporated. The product is then tested by the well-known color reaction for saffron, with sulphuric acid and nitric acid.—Pharm. Journ. and Pharmacist, July 12, 1913, 47; from Staz. Sperim. agrar. Ital., 46, 18.

#### ZINGIBERACEÆ.

**Achasma Walang.**—*Properties of Volatile Oils from Leaves, Stalks and Roots.*—Quoting from the "Jaarb. dep. Landb. in Ned.-Indie" (Batavia, 1911, 45), Schimmel & Co. observe that at



Buitenzorg oils have been distilled from the leaves, stalks and roots of *Achasma Walang*, Val., known in Java as "daon walang," and mention that when the distillation is conducted under ordinary pressure, decomposition ensues. The properties of these oils are enumerated as follows:

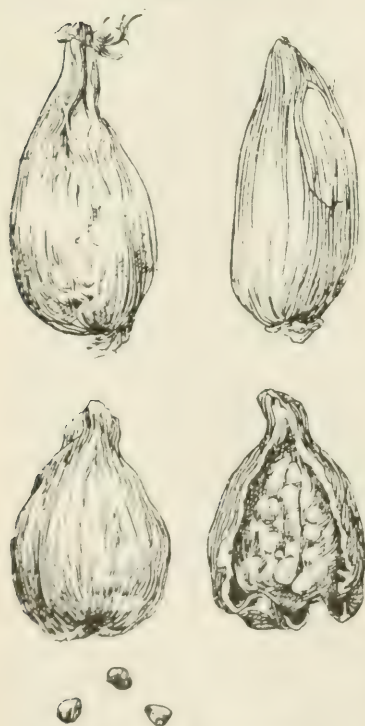
**Oil from Leaves.**—Yield,  $0.25\%$ ; sp. gr.  $16^{\circ}$ , 0.850; opt. rot.,  $-0^{\circ} 34'$ ; acid val., 10.1; sap. val., 70; aldehyde content (sulphite method), 97%.

**Oil from Stalks.**—Yield,  $0.2\%$ ; sp. gr.  $16^{\circ}$ , 0.860; opt. rot.,  $-0^{\circ} 58'$ ; acid val., 26; sap. val., 75.6; sap. val. after acetyl., 285.6; aldehyde content (sulphite method), 96%.

**Oil from Roots.**—Yield,  $0.15\%$ ; sp. gr.  $16^{\circ}$ , 0.856; opt. rot.,  $-0^{\circ} 30'$ ; acid val., 18.9; sap. val., 70; sap. val. after acetyl., 285.6; aldehyde content (sulphite method), 96%. —Schimmel's Semi-Ann. Rep., October, 1913, 19.

**Korarima Cardamoms.**—*Appearance and Sale in London.*—The

FIG. 55.



Korarima Cardamoms.

"Chemist and Druggist" calls attention to the recent appearance on the London market and sale at the drug-auction, of sixteen bags of cardamoms shipped from Port Sudan, and subsequently of forty-four bags, sold in open competition. Drawings of typical specimens of these fruits, which are those originally designated by Pareira as *Amomum korarima*, are reproduced in the accompanying cut (Fig. 55). This spice, which has met with so little attention, is the *Cardamomum majus*, of Valerius Cordus and Matthioli, which was mentioned in most ancient pharmacopœias. The fruit has since disappeared from European commerce. Pareira's specimens were brought to him from Abyssinia, but the plant itself has apparently never been described. His description of the fruit is as follows: "Capsules ovate, pointed,



flattened one side, striated, with a broad, circular umbilicus or scar at the bottom, around which is an elevated notched and corrugated margin." The rounded or somewhat angular seeds, are not burning to the taste like "grains of paradise."

Korarima cardamoms are collected by natives of South Abyssinia in the 'Tumbr district, which is called by them "the country of the korarima." They are taken to Basso, an important agricultural center, and from there are carried to Massowah.—Chem. and Drugg., November 15, 1913, 724.

#### ORCHIDEACEAE.

**Vanilla.**—*Question of Toxicity.*—In the course of years numerous cases of poisoning of persons who had partaken of food flavored with vanilla has led to the suspicion that the poisoning was caused by the vanilla. Bacteriologists, chemists and clinicians have been engaged in the endeavor to determine the nature of the toxic substance to which the immediate cause of the intoxication was attributable in these cases, but it remains to this day an open question whether or not it was due in any of these cases to the vanilla used as flavoring. Dr. Adolf Eisenmenger now directs attention to a recent case of poisoning of ten persons who had partaken of a pudding flavored with vanilla, which seems calculated to clarify, in a measure at least, the question of the toxicity of vanilla. In this case two small sticks of the vanilla, each about 5 Cm. long, which had been used for the flavoring of the pudding, were available for examination. These, neither in appearance, odor, nor taste, gave any evidence of inferiority or deterioration and after through chemical, bacteriological and biological examination in the Bacteriological Institute, by Prof. Czaplewski, the vanilla was pronounced of unexceptional quality. A series of experiments failed, as in the case of similar experiments in previous cases, to determine any harmful effects from the vanilla in question. The author suggests that the toxic effects produced by the pudding, as well as in previous cases, must be attributed to some other ingredients of the vanilla food, most likely material which had decomposed with formation of ptomaines. —Pharm. Ztg., lviii (1913), No. 17, 168; from Med. Klinik, Wien.

#### SANTALACEAE.

**Sandalwood Trees.**—*Propagation in German East Africa.*—In an article on certain aromatic woods, W. Holtz gives detailed particulars concerning the propagation of sandal wood trees in German East Africa. He says that the trees have been planted out

singly by way of experiment in several localities, and the experience has been made that low-lying situations on the littoral offer suitable conditions for the development of the tree. A few specimens have already reached an age of twenty years; they present a thoroughly flourishing appearance, and have seeded regularly for several years. Numerous young trees have sprouted in all these localities from fallen seed, or from seeds which have been dropped by birds and insects, and all these young plants are likewise developing satisfactorily. Judging from present observations, the tree does not appear to be exacting in respect of the richness of the soil in which it grows. The best plan is to rear the tree directly from the seed on the spot where it is desired to grow it. The cultivation of seedlings in a seedbed and subsequent transplanting is not recommended, because it has been shown that a large percentage of the transplanted young trees perish or become weakly. It is also advisable, when sandalwood trees are grown directly from seed, not to prepare the soil too thoroughly, inasmuch as it should contain a sufficient proportion of living roots and other growing vegetable matter to which the young sandalwood plant can attach its suckers. Whether it will be possible to cultivate the sandalwood tree in special plantations is a question which cannot be solved until more exhaustive experiments have been made.—Schimmel's Semi-Ann. Rep., October, 1913, 97; from *Der Pflanze*, 9 (1913), 236.

#### LAURACEAE.

**Camphor Production.**—*Japanese Monopoly.*—According to the "Ostasiatische Lloyd" the present position of the camphor monopoly of Japan is said to be very favorable. Competition, which was at times extremely keen, has diminished, and the camphor monopoly, with a total of 55% of the world's production, again dominates the markets of the world to a large extent. The world's total output is estimated at about 9 million cattiees, of which  $3\frac{1}{2}$  million (a part of 5 million cattiees of camphor oil) are produced in Formosa and  $1\frac{1}{2}$  million in the islands of Kiushiu and Shikoku. Japan, therefore, at present produces 5 million cattiees yearly. The camphor production in the Chinese province of Fukien cannot become a dangerous rival to the Japanese production, or at any rate only temporarily, because there is in China no law compelling the planting of camphor trees to replace those cut down, and therefore, reckless extermination of the native plants will before long have destroyed the present reserves, besides which the means of communication in Fukien are very backward

On the other hand, enormous plantations of camphor trees have been made by Europeans in Borneo, Sumatra and Java; and, while it is true that for the next 20 or 30 years competition will not be felt, it will then be very serious. To this competition, however, as well as that of synthetic camphor, Japan will be able to oppose the uniformly disciplined action of the "Monopoly Bureau." Although the camphor supplies in Old Japan are said to be very nearly exhausted, for the present it will still be possible there to manufacture sufficient camphor from the leaves; but in order to be guarded against any contingencies, the "Monopoly Bureau" is said to be determined to restrict the production permanently to the equivalent of that of last year, and also to maintain the present price of crude camphor.—Schimmel's Semi-Ann. Rep., October, 1913, 31; from Ostas. Lloyd, 1913, No. 11, 84.

**Camphor.**—*Cultivation Experiments in Japan.*—A Dutch commercial paper directs attention to several new plantations of camphor trees in Japan and adjacent islands off the coast. The soil and climate of these islands are said to be particularly favorable to camphor cultivation. The article refers particularly to the Idzu region (Japan) and to the Bonin and the Vries islands. The results have been very favorable; the trees flourished and began to yield camphor after only 4 years. Camphor of good quality was distilled from the leaves in 1912.—Schimmel's Semi-Ann. Rep., April, 1913, 38.

**Camphor.**—*Adulteration with Cane-Sugar.*—E. Labbé directs attention to a peculiar adulterant of camphor. In the course of preparing spirit of camphor, he found the cake employed to contain cane-sugar to the amount of 20 per cent.—Pharm. Ztg., lviii (1913), No. 75, 750; from Bull. d. Science Pharmacol., xx (1913), No. 6.

**Camphor.**—*Saturated Aqueous Solutions.*—H. Leo finds that camphor is less soluble in hot than in cold water, as upon heating camphor water in a glass vessel, some of the camphor will sublime. This camphor will not dissolve in the hot solution, but will again dissolve upon agitation when the solution becomes cold. It is, therefore, impracticable to prepare an aqueous solution of camphor by heat. The author finds that Ringer's solution is the best medium for the preparation of a saturated aqueous camphor solution, which is especially adapted for intravenous injections, the same as camphor oil. Camphor is soluble in Ringer's solution at



150° C., in the proportion of 1 in 490.—D. Med. Wschr., 1913, 591. (O. R.)

**Camphor in Pneumonia.**—H. Leo was able to protect numbers of mice against pneumococcus infection by subcutaneous injection of a saturated aqueous solution of camphor; the results were less constant with rabbits. He thinks camphor is able to kill the pneumococci in the blood stream and promote reabsorption of the pneumonic exudate. It also has a marked action in increasing the ventilation of the lungs, the amount of air inspired being very much larger under the influence of camphor and the drug stimulates the action of the heart.—Münch. Med. Wschr., 1912, v. 60, No. 43; J. Am. M. Assoc., 1913, v. 61, 2112. (M. I. W.)

**Cinnamon.**—*History, Etc.*—The "Chemist and Druggist" gives an interesting historical account of "cinnamon," its botany, cultivation and commerce, the article being embellished with plantation photographs, showing the method of cutting, peeling, drying and sorting the drug, these various operations being described in detail.—Chem. and Drugg., Mar. 8, 1913, 391-393.

**Litsæa Polyantha.**—*Examination of the Fruits and Seeds.*—Quoting from an Annual Report of the Indian Museum, Calcutta, David Hooper gives the results of an examination of the fruits of *Litsæa polyantha*, Juss., a small evergreen tree met with from the Punjab along the foot of the Himalayas eastward to Assam—the particular fruits examined being received from Golaghat, Assam. The cleaned seeds yielded 21.2 and the kernels 33 per cent. of white crystalline fat, melting at 38.5°. The constants were: acid value, 98.9; saponification value, 244.8; iodine value, 34.4. The fat is of a useful nature, and consists very largely, like that of other *Litsæas*, of lauric acid. It is used medicinally.—Pharm. Journ. and Pharmacist, September 6, 1913, 369.

#### POLYGONACEAE.

**Polygonacea Cocobolo.**—*Irritant Action of Its Wood.*—According to A. Nestler, the American wood known as "Fose" or "Cocobolo wood," said to be derived from *Polygonacea cocobolo*, and imported into Europe for making the backs of hair-brushes, has a very irritating action on the skin, like satinwood and several other foreign woods used by cabinet makers. Contact of the skin with the sawdust of "cocobolo" wood causes an intense dermatitis, similar to that produced by the irritating hairs of *Primula obconica*. The extract of the wood also acts as an irritant on the skin. The active



principle, which has not yet been isolated, is soluble in water, alcohol and benzol.—Pharm. Journ. and Pharmacist, August 16, 1913, 281; from Ber. d. deutsch. bot. Ges., 30, 120.

**Rhubarb.**—*New Variety from the Altai Mountains.* Tschirch and Ruszkowski have studied a new rhubarb coming from western Siberia and while the seeds which were obtained along with it and which they have planted have not grown sufficiently to determine its botanical origin, the chemical analysis of the root shows it to belong to the Rhaponticum group.

The root contains:

1. Rhaponticin ( $C_{21}H_{24}O_9$ , m. p.  $231^\circ$ ), a glucoside which hydrolyzes to *d*-glucose and rhapontigenin ( $C_{17}H_{22}O_3$ , m. p.  $181^\circ$ – $182^\circ$ ).
2. A chrysophanic acid (m. p.  $175^\circ$ ) containing methoxyl groups, which was eventually separated into
3. Chrysophanol (methoxyl-free chrysophanic acid),  $C_{11}H_5O_2$ – $(CH_3)(OH)_2$ , m. p.  $196^\circ$  and
4. Emodin mono-methyl ether,  $CH_3C_{14}H_4O_2(OH)_2OCH_3$ , m. p.  $200$ – $202^\circ$ .
5. Emodin,  $C_{15}H_{10}O_5$ , m. p.  $250^\circ$ .
6. Rheotannoglucoside, presumably hydrolyzing to rheum red.
7. Some anthraglucosides, which gave rheonigrin as one hydrolysis product.
8. Dextrose, in a free state.

The work suggested the possibility of the formation of a water soluble sulpho-compound of emodin, when this was treated with concentrated sulphuric acid, but the isolation of this was not accomplished. The paper closes with a suggested colorimetric assay which when applied to the Altai rhubarb showed 3.2% anthraquinone.—Arch. d. Pharm., 251 (1913), No. 2, 121. (H. V. A.)

**Japanese Rhubarb.**—*Botanical Source, Characters and Active Constituents.*—G. Murayama states that the exact botanical source of Japanese rhubarb has not yet been determined, two species of *Rheum* (*R. rhaponticum*, L., and *R. undulatum*) coming into consideration, these having years ago been introduced in Japan. The drug as supplied on the market consisted of dirty brown, mostly cylindrical pieces of the rhizome having a woody structure. For the purpose of determining its constituents, the drug was comminuted and extracted with several successive portions of 80% alcohol; the alcohol was removed from the tincture by distillation, and the residue extracted with ether. The portion insoluble in ether was then acidulated with 3% sulphuric acid

hydrolyzed by heat, then extracted with ether, and the united ether solutions obtained by the two operations subjected to distillation and the residue shaken with soda solution (5%). The portion insoluble in soda solution was then dissolved in 5% potassium hydroxide solution and the solution saturated with carbon dioxide, whereby a crystalline precipitate was obtained which after several crystallizations had a melting point of 175°–177°, and consisted of *chrysophanic acid*.

The soda solution was next acidulated with hydrochloric acid, the precipitate produced was dried at 110°, and extracted with toluol; the toluol solution was concentrated to a small volume and poured into a large volume of petroleum ether, whereby a substance was separated which after repeated crystallization from benzol yielded yellowish red crystals of *Emodin*.

Among the sugars produced by the hydrolysis described only *grape sugar* was identified by the formation of phenylosazone. The total *oxyanthraquinones*, which were subsequently determined quantitatively by a separate investigation carried out by Tschirch and Edner, was 4.14 and 4.10% in two experiments.—Pharm. Ztg., lviii (1913), No. 27, 266; from Journ. Pharm. Soc. Japan.

**Rheum Rhaponticum.**—*Detection.*—According to Tschirch and Christofolheti, admixture of *Rheum rhaponticum* in official rhubarb can be detected by the isolation of the glucoside rhaponticine, which does not exist in *Rheum officinale*. Ten grams of the powder are exhausted with 60 per cent. alcohol, so as to obtain 25 grams of extract. This is filtered, if necessary, and evaporated on the water bath until the residue weighs about 7 grams. To this 10 Cc. of ether are added, the whole well shaken, and allowed to stand. In the case of *Rheum rhaponticum*, a brownish crystalline deposit is obtained at the end of about four hours, in the form of fine needles insoluble in ether, chloroform, benzol, and petroleum ether. The crystals are colored red by alkali and give off the odor of benzaldehyde on contact with nitric acid. With a mixture of 25 parts of genuine and 75 of rhaponticum the crystallization takes about twenty-four hours, and with 75 of genuine and 25 of rhaponticum several days are necessary for the crystallization.—Chem. and Drugg., October 11, 1913, 553; from Annal. Chim. Analyt., 1913, 361.

**Powdered Rhubarb.**—*Investigations to Establish B. P. Standards.*—At the suggestion of Professor Greenish, an investigation was undertaken by E. T. Brewis and H. Deane, for the purpose

of discovering what is a fair standard of extractive for powdered rhubarb, if it is decided to follow the example of many Continental Pharmacopœias by inserting such a requirement in the B. P.; and also to investigate the quality of powdered rhubarb at present being sold. The details of these experiments and the results were communicated by the authors in a paper presented to the British Pharmaceutical Conference, 1913, of which the following is a brief outline: The material examined was obtained from reliable wholesale and retail dealers, and also consisted of samples ground by a well-known manufacturing firm, all these being carefully designated according to label, or otherwise, in the tables giving the results of the examination.

**The Determination of Moisture** was made by drying 5 grams in a flat-bottomed, stoppered weighing-bottle placed in an air-oven, which was maintained at a temperature of  $100^{\circ}$  to  $105^{\circ}$  C. It was found that the loss of moisture proceeded at an irregular rate, and the operation was tedious, as prolonged drying was necessary in order to obtain approximately correct weights.

**The Determination of Alcoholic Extract** was carried out as directed in the German Pharmacopœia: "Five grams of the air-dry powder was macerated for twenty-four hours in 50 Cc. of dilute alcohol (50 per cent. by volume); 20 Cc. were filtered off and evaporated in a shallow, flat-bottomed nickel dish, and finally dried at  $105^{\circ}$  C., which took about twenty hours."

**The Ash** was obtained by incinerating 1 gram in a shallow platinum dish placed in a muffle heated to dull redness, with free admission of air, this operation occupying from twenty to thirty minutes. No examination was made of the ash, but each sample was treated with dilute hydrochloric acid, in which, with four exceptions, they were almost entirely soluble.

**The Microscopic Examination**, the authors note, was very satisfactory. None of the samples showed evidences of adulteration. Several contained occasional fragments of sclerenchymatous fibers, probably derived from fragments of string that are sometimes left in the pieces. It is noteworthy also that rhubarb does not contain any lignified tissue. It contains vessels with thickened walls, but these will not stain with phloroglucin or other reagents for lignin, so that anything in powdered rhubarb stained red by phloroglucin may be put down at once as foreign matter.



**The Conclusion** drawn by the authors from the figures presented in the tables is, that the limit of ash of 12 per cent. on the air-dry drug suggested by the Committee of Reference in Pharmacy will include nearly all the powdered rhubarb of commerce, but it is notable that two samples with 13.04 and 12.28 per cent. are both in other respects very good samples. For the extractive, the minimum of 35 per cent. on the air-dry drug demanded by the German Pharmacopœia seems to be reasonable. Trans. Brit. Pharm. Conf. (Yearbook of Pharmacy), 1913, 524-529.

#### CHENOPODIACEAE.

**"Schepti."**—*An Abyssinian Tænifuge Containing Saponin.*—At a meeting of the Upper-Alsatian Apothecaries Association, Prof. E. Schaer exhibited some fruits which are used in Abyssinia, where they are known as "Schepti," as a tænfuge. These fruits, which are derived from an African species of *Phytolacca*, namely

*Phytolacca Abyssinica* (also described as *Pirkunia abyssinica*), have been subjected to chemical examination in the Pharm. Institute of Strassburg by Dr. R. Kueny, who has isolated from them a pure saponin in considerable quantities. This accounts for the fact that, besides being valued as an effective tænfuge, "Schepti" is also used by the Abyssinians as a detergent and substitute for soap for washing purposes, just as are the many other plant substances containing saponin. Dr. Kueny has also isolated other interesting chemical substances from these fruits which he promises to describe in the near future.—Pharm. Ztg., lviii (1913), No. 71, 709.

#### PRIMULACEAE.

**Primula Officinalis.**—*Glucosides and Ferment from the Root.*—Some years ago A. Goris and M. Mascré conducted an investigation of the root of *Primula officinalis*, Jacq., which resulted in the determination of two glucosides, *primverin* and *primulaverin*, as well as of a ferment, *primverase*, which is concerned in the production of volatile oil from them (see Proceedings, 1910, 176). The authors have now, in collaboration with C. Vischniac, continued their investigations which are interestingly given in abstract by Schimmel & Co. By a method, which is clearly described, the authors obtained from the green root 0.1 per cent. of a crude glucoside mixture, from which they were able to isolate the two glucosides in the proportions of 20 to 25% of primverin and from 10 to 15% of primulaverin—the rest consisting of intermediary products, with the complete determination of which they are at



present still engaged. The root of *Primula kewensis*, Hort., yielded these glucosides also, identical in properties with those of the first-named species.

**Primverin**,  $C_{20}H_{28}O_{13}$ , is a glucoside forming anhydrous crystals, liquefying at  $203^{\circ}$  to  $204^{\circ}$ , with the corresponding m. p. of  $206^{\circ}$ , and an optical rotation of  $-71.53^{\circ}$ . The previously given characters, viz., m. p.  $172^{\circ}$  and opt. rot.  $-60.24^{\circ}$ , are incorrect, the small quantity of experimental material available when these data were given precluding any thorough-going separation. When hydrolyzed with acids, one molecule of primverin yields 1 mol. of *p*-methylether- $\beta$ -methylresorcyate and two mol. of monoses—probably a pentose and a hexose. The *p*-methylether- $\beta$ -resorcyate (4-methoxymethylsalicylate) is the principal constituent of the volatile oil of primrose root. It melts at  $40^{\circ}$  and is identical with the so-called "primula camphor."

**Primulaverin**, the second glucoside is a body with a m. p. of  $161^{\circ}$  to  $163^{\circ}$ , opt. rot.,  $-66.56^{\circ}$ . It crystallizes with two molecules of water and possesses the same empirical formula as does primverin. It probably results from an isomorphic crystallization of primverin with primulaverin proper, which latter up to the present has not been isolated in the pure state but appears to be closely related to primverin. The volatile oil which is formed from primulaverin by hydrolysis consists of a mixture of the methyl esters of *p*-methylether- $\beta$ -resorcylic acid and *m*-methoxy-salicylic acid. The authors have as yet been unable to decide whether

**Primulase**, the ferment concerned in the formation of the volatile oil, is or is not a new ferment. It is without doubt closely allied to, if not identical with, betulase, which occurs in *Betula lenta*, *Gaultheria procumbens*, and *Monotropa hypopitys*, and is found widely distributed throughout the family of the *Primulaceae*. It is obtained from the powdered dried leaves of the calyx, the glucosides being removed by extraction with alcohol and ether—the ferment being thus left behind in the powdered leaves. The pale green

**Volatile Oil of Primrose**, obtained by macerating the flowers for 6 hours with water and subjecting them to steam distillation (in a yield of 0.00086%) consists in part of saponifiable and in part of non-saponifiable constituents. The constitution of the

latter has not yet been ascertained.—Schimmel's Semi-Ann. Rep., April, 1913, 84-86.

#### SCROPHULARIACEAE.

**Digitalis.**—*Constituents.*—According to such an authority as Prof. R. Kobert, the active constituents of digitalis leaves can be divided in two groups, namely, the digitalin group and the saponin group. The heart stimulants are digitoxin, digitophyllin and gitalin. The inactive saponins are gitin, digitalin and saponin. It is probable that the glucosides are more active in the presence of the saponin group. The saponins in digitalis leaves have no hemolytic action, while those of the seeds produce hemolysis. *It is rather remarkable that digitalis leaves which have been extracted with water, as for instance in the infusion, still contain the entire amount of digitoxin, digitophyllin and gitin.*

Digitalis leaves, furthermore, contain oxidizing enzymes which decompose the glucosides, for which reason it is absolutely necessary to dry the leaves rapidly and preserve them in a dry place. The leaves of the red digitalis also contain manganese and more enzymes than those of the yellow digitalis.

Kobert recommends to prepare tincture of digitalis from the fresh leaves with pure alcohol. He considers the ethereal tincture of digitalis as unnecessary, as the spirit of ether is an inferior solvent to pure alcohol. Kobert sees no advantage in the so-called "dialyzed" digitalis preparations. He finds that "digalen" does not contain digitoxin, but contains gitalin and digitsaponin, the same as the infusion.—Ph. Zhalle., 1913, No. 12. (O. R.)

**Digitalis.**—*Pharmacological Notes.*—At a meeting of the "Société de Thérapeutique de Paris" in May, J. Chevalier brought forward his observations on the pharmacological activity of digitalis, made with plants at the beginning of the growing season, and carried on until after fruiting. The maximum activity is attained when the leaves are fully developed: they lose part of their toxic properties in the autumn. The seeds contain the same active principles as the leaves. In young leaves digitalein is formed before digitalin. All digitalis, cultivated or wild, growing in chalky or sandy soil, contains both digitalein and digitalin, but the plants grown on chalk contain less. All digitalis grown on acid soil may be used as the official drug, and will contain at least 0.3 permille of digitalin, calculated on the dry leaves. The digitalis of the Vosges does not appear to be really superior to that of other localities. Too much sunlight is not favorable to the retention of active principles;

the plant requires at least a partial shade. It should be gathered at maturity, and dried carefully and rapidly in the shade. There is no difference in activity between plants of the first and second year; it is identical when development is complete. There is no connection between the value attributed to infusion of powdered digitalis leaf and the amount of digitalin in that leaf. As Kobert has recently shown, the main constituents of the infusion are gitalin and digitonin; but there may be also a little digitalin present, although the greater part of that glucoside remains in the leaf, from which it can be isolated by subsequent extraction with alcohol. —Pharm. Journ. and Pharmacist, September 20, 1913, 437; from Journ. de Pharm. et Chim., 1913, 7, 188.

**Active Principles of Digitalis.**—*Discussion.* At a meeting of the "Société de Thérapeutique" held in June, Bardet declared that much of published literature concerning the drug was incorrect or founded on false premises. He emphatically supports the contention of Chevalier that there is no such thing as a single active principle representing the drug. It owes its value to several very complex organic substances, which, under the influence of ferments, give decomposition products, which may themselves be active. The value of digitalis depends in no way on its digitalin content. It does not exist as such in the drug. Digitalein, digitonin, and digifolin may occur in the plant. The most rational galenical preparations of digitalis for medicinal use are those which are prepared without the intervention of reagents. The speaker emphasized the necessity of carefully noting the results obtained by means of the biochemical method, and of using, as far as possible, preparations of fresh plants, the tissues of which have been deprived of their active, hydrolyzing ferments. Chevalier stated that he also is convinced that the therapeutic activity of preparations of fresh plants is infinitely superior to that of crystalline principles, and that when properly administered they give remarkable results. Among the digitalis constituents, digifolin is specially interesting. It contains in its molecule both digitalin and digitalein. Its properties and reactions closely approach those of the juice of the fresh plant. Soluble in water, it has a pharmacodynamic value almost identical with that of digitalin, but is less toxic and non-irritant. It may, therefore, be used by hypodermic injection. Ibid., October 18, 1913, 573; from Ibid., 1913, 8, 228.

**Digitalis.**—*Influence of Alcohol upon Its Toxicity.*—In a recent paper on biological standardization, Eggleston draws attention

to the fact that in Hatcher's "cat method" the presence of alcohol does not influence the results when the digitalis bodies are tested, but suggests that this may not be the case when the guinea pig or frog is used as a test animal. Charles H. Haskell has now carried out experiments, which he reports in detail, upon guinea pigs and rabbits in the attempt to secure definite information on this point, using U. S. P. tincture of digitalis, containing originally 48% alcohol, for this purpose. His results show clearly that when digitalis preparations are tested by subcutaneous administration to guinea pigs or rabbits, account must be taken of the alcoholic content of such preparations, because the results will be markedly influenced by the presence of considerable amounts of alcohol. — Journ. A. Ph. A., July, 1913, 836-838.

**Digitalis.**—While much has been published in recent years on the physiologic standardization of digitalis, it is only occasionally that comprehensive, critical studies appear which treat of individual preparations in a way to be of direct use to the practitioner. Almost the only studies of the latter character that have appeared in this country have emanated from the Hygienic Laboratory of the United States Public Health Service; those relating to digitalis were reviewed in the Journal for June 12, 1909, and April 22, 1911. Comparative studies of this subject are equally infrequent in European countries. A recent paper by Weis, of Vienna, deals in part with certain preparations of American origin and with others extensively advertised in this country. Weis found certain commercial ready-made tinctures to be fifteen times less active than the tinctures made from good leaves in accordance with the directions of the Austrian Pharmacopœia. He states that the apothecary would fulfil his obligations to the physician and patient much better if he would prepare tinctures himself instead of dispensing some of those ready made. — J. Am. M. Assoc., v. 60, 143. (M. I. W.)

**Digitalis.** *Its Keeping Properties and Its Preparations.* — Variations in the strength of digitalis and its preparations may be due to two causes: (a) variations in the crude drug; and (b) variations due to the manner in which the drug and the various preparations made from it have been treated or prepared. It is now well known that the crude drug varies considerably in activity, but the causes of these variations are for the most part unknown. The practical outcome of this work is the demonstration that in order to obtain preparations of uniform ac-



tivity only physiologically tested leaves should be used. The preparations made from even a good sample of the crude drug may, however, vary greatly in activity. One of the most important factors determining this is the manner in which the drug is extracted.—J. Am. M. Assoc., 1913, v. 61, 202. (M. I. W.)

**Digitalis.** Eggleston and Hatcher discuss the emetic action of the digitalis bodies and report a number of observations. They conclude that digitalis bodies are capable of causing nausea and vomiting when moderate doses are introduced in the circulation of the cat and dog, the amounts required in some instances being far less, actually, and relatively in proportion to the weight of the animal, than are those that have been used therapeutically in a single day. The nausea and vomiting in these cases were due to the action on the vomiting center in the medulla. It is quite certain that at the present time we have no means of securing the cardiac actions of the digitalis bodies without subjecting the vomiting center to the influence of these agents at the same time. There is, therefore, no advantage in substituting one method of administration or one member of the group for another. — J. Am. M. Assoc., v. 60, 499–503. (M. I. W.)

**Digitalis.** Cary Eggleston reports some clinical observations on the emetic action of digitalis and concludes that there is neither valid experimental nor clinical evidence that therapeutic doses of the digitalis bodies cause nausea or vomiting through local irritant action on the alimentary tract. All true digitalis bodies produce nausea and vomiting by direct central action, so that it is fallacious and wholly irrational to seek to avoid these symptoms, resulting from the oral administration of any given preparation, by resort to another preparation or to another channel of administration.—J. Am. M. Assoc., 1913, v. 61, 757–761. (M. I. W.)

**Digitalis Bodies. Their Elimination.**—According to Hatcher, the digitalis bodies show such wide differences in the duration of their action, even after intravenous administration, that one would be inclined to expect similar variation in their rate of elimination. The difficulties attending the quantitative chemical estimation of these bodies have interfered with the investigation of their elimination, and we know almost nothing of their fate in the organism. We have no evidence of the rapid destruction or the fixation of the digitalis bodies in the animal organism. Certain of the digi-

talis bodies leave the mammalian circulation very rapidly but we have no evidence that they are stored in greater concentration in one tissue than in another.—J. Am. M. Assoc., 1913, v. 61, 386-388. (M. I. W.)

**Digitalis Bodies.**—*Emetic Action.*—The doses of the digitalis bodies required to produce manifestations of vomiting in eviscerated animals are strikingly comparable to those used therapeutically. The conclusion seems inevitable, therefore, that the emesis sometimes seen in man after the oral administration of therapeutic doses of digitalis bodies is due mainly, if not exclusively, to their action on the vomiting center in the medulla. The similarity observed in some of the laboratory animals leaves no ground for supposing that the mechanism of the emetic action in man is in any way different from that seen in animals. The purgative action also appears to be of central origin. J. Am. M. Assoc., v. 60, 371. (M. I. W.)

**Stemona Sessilifolia.**—*Constituents of the Root.*—According to T. Furuya, the root of *Stemona sessilifolia* has a long-standing reputation in Japan as a remedy for pulmonary diseases. It is also used as a horticultural insecticide, being burnt, for this purpose, under fruit trees. A decoction is also used to kill lice. The author and Nagai have already found, in 1895, that the allied *Stemona japonica* contains alkaloids. The former now detects the presence of a base in *S. sessilifolia*, but only in small amount—0.017 per cent. It forms crystalline salts; the hydrobromide is a white crystalline powder, melting at 258-259° C., very soluble in water and in methyl alcohol; sparingly soluble in ethyl alcohol and in petroleum ether. It has the formula  $C_{19}H_{31}O_5N \cdot HBr$ . The hydrochloride, also crystalline, melts at 244°-247° C. The base has been named *hodozurine*, from the Japanese name of the drug, "hodozura."—Pharm. Journ. and Pharmacist, August 16, 1913, 281; from Nouv. Remèdes, 30 (1913), 329.

#### SOLANACEAE.

**Atropa Belladonna.**—*Alkaloid Content of Plants Grown in India.*

David Hooper, quoting from an Annual Report of the Indian Museum, Calcutta, says it was shown last year that the roots of belladonna plants grown in the Kumaon Botanical Garden yielded 0.4 per cent. of alkaloid when one year old and 0.45 when two years old. A sample of roots from three-year-old plants was received this year, and was divided into thin and thick roots. The former yielded 0.4 per cent. of alkaloid, and the latter 0.44

per cent., showing that the root does not increase in alkaloidal content after the second year.

The leaves of belladonna grown in the same gardens were also examined. Leaves from one-, two-, and three-year-old plants afforded 0.48, 0.49 and 0.49 per cent. of alkaloid, respectively. This indicates that leaves from plants of different ages grown in this situation are practically constant in composition. Pharm. Journ. and Pharmacist, September 6, 1913, 369.

**Belladonna.** *Culture Experiments in Minneapolis.*—At the Denver meeting of the Association, Manly H. Haynes and E. L. Newcomb presented a paper describing in some detail the methods used and the observations recorded in a research on the feasibility of cultivating *Atropa belladonna* in Minnesota, as a commercial possibility, the culture experiments being carried on at the medicinal plant garden of the College of Pharmacy of the University of Minnesota. A large number of plantings were made under varying conditions, but as yet no way has been found to materially shorten the period of germination of the seed. It has been noted, however, that in nearly every planting test a small per cent. of the seed would germinate in from two to three weeks, the remainder requiring four or five weeks when kept moist and at a temperature of from 50° to 60° F. Practically, every sample of seed tested yielded a large per cent. of plants, although some of the seed was known to be several years old. Furthermore, under normal conditions of temperature, the young seedlings, if provided with abundant water and good drainage, grow quite rapidly and are usually sufficiently large for field planting within eight weeks. Recent discussions on the advisability of admitting the entire plant of *Atropa belladonna* into the Pharmacopœia to represent the drugs *Belladonnæ radix* and *Belladonnæ folia* made it important to determine by assay the alkaloidal content of the individual parts of the plant—leaves and tops, stems, roots including and deprived of the crown and rootlets, the latter by themselves, and finally the entire plant. The results were quite satisfactory, the lowest yield of alkaloid in any of these parts being 0.2601%, the general average about 0.4%, while the fine rootlets and sprouts, which are usually lost in the commercial drug showed the high content of 0.60% to 0.688% of alkaloid. It appears from the results so far obtained that *Atropa belladonna* can be successfully cultivated in Minnesota, if due care is taken in the germination of seeds and the handling of young plants. The development of perfectly hardy strains, however, is a matter which will take much

experimenting and careful study. -Journ. A. Ph. A., April, 1913, 431-436.

**Cayenne Pepper.** *Source of the Sweet or Non-Pungent Variety.*

Tracing up the botanical history of the "sweet or non-pungent Cayenne pepper," the powder of which is used for canaries, E. M. Holmes mentions that as long ago as 1881 the late Professor T. C. Archer pointed out that such a powder was made in Spain from *Capsicum tetragonum*, Mill., which was known in that country as "*Pimento*," and that of this fruit two kinds, a crimson and a golden yellow, were used in salads. Later (1885), H. B. Brady pointed out that a pepper very similar in color was used in Hungary under the name of "*Paprika*," and that this had so little pungency that a teaspoonful could be used at a time as a condiment. Specimens of this were proved to belong to the fruit described in Miller's "*Gardner's Dictionary*" as *Capsicum tetragonum*. A figure representing this form was, however, given in 1904 by Mr. H. C. Irish, and referred by him to *Capsicum annuum*, var., *grossum*, for which the English name "sweet Spanish capsicum" was given, while during the same year Mr. J. Ramsden presented to the Museum of the Society some specimens of a capsicum of quite a different shape, as the source of the bright red, oily, sweet cayenne pepper given to canaries. These fruits were imported from Spain, and proved to be identical with those figured by Mr. Irish under the name of squash or round Spanish pepper, *Capsicum annuum*, var., *grossum*, which is distinctly different from the *Capsicum tetragonum* of Miller, and is probably identical with the *Capsicum annuum*, var., *Tzege-dinense*, described in "*Gardner's Chronicle*" as the source of "paprika." It would appear from Mr. Holmes' investigations, therefore, that the sweet cayenne powder used for heightening the color of the feathers of canaries, if imported from Spain, is derived from the fruits of *Capsicum annuum*, var., *grossum*, and if from Hungary, from the fruits of *Capsicum annuum*, var., *Tzege-dinense*. -Pharm. Journ. and Pharmacist, May 3, 1913, 626.

**Cestrum Parqui.** *Isolation and Description of an Alkaloidal Constituent of the Leaves.* - After giving a detailed and illustrated botanical description of *Cestrum parqui*, a shrub growing in South America, especially in the central provinces of Chili, where the plant is called "Parqui," and is used by the natives as a sudorific and antipyretic, J. Mercier and J. Chevalier give the details of a chemical examination of the leaves, from which an alkaloid and a glucoside have been isolated. The name *Parquine* is given by



the authors to the alkaloid, which is extracted from the roughly powdered leaves by mixing with a small quantity of slaked lime, moistened and left for four hours, then extracted with 95 per cent. alcohol. The strongly yellow percolate is evaporated to a syrup, treated with 2 per cent. hydrochloric acid, which precipitates a large amount of a yellowish green body; this is separated, and dried *in vacuo*. The filtered acid solution is neutralized with sodium carbonate, to obtain the alkaloid, which separates as a dirty white, flocculent precipitate. This precipitate is suspended in chloroform, filtered, the insoluble matter dissolved in water slightly acidified with hydrochloric acid; the solution neutralized as before, the precipitate formed taken up with chloroform, this precipitate probably being alkaloid not displaced by the first operation. The chloroformic liquors evaporated *in vacuo* leave a yellowish mass of crystalline appearance, almost entirely soluble in the dilute acids; it represents the crude alkaloid. More alkaloid is obtainable from the resinous bodies precipitated at the commencement of the operation. The parquine thus obtained has an extremely bitter taste, very like that of strychnine. The yield by this process was 80 centigrams per kilogram of leaves. The formula provisionally assigned is  $C_{21}H_{39}NO_8$ . Parquine is insoluble in water, very soluble in alcohol, especially when hot; soluble in chloroform, insoluble in petroleum ether and benzene; very slightly soluble in ether; m. p. about  $180^{\circ}$ – $181^{\circ}$ . It is stable, but saline solutions of it rapidly become colored deep yellow. Solutions of the alkaloid are precipitated by Mayer's and other reagents, and concentrated sulphuric acid colors the alkaloid violet. Pharmacologically, the alkaloid is a nerve and muscle poison. Unlike strychnine, it diminishes the sensibility and conductivity of the nerves, and acts on the sensitive extremities after the manner of atropine, thus producing local analgesia. The glucoside has not yet been studied. Pharm. Journ. and Pharmacist, November 15, 1913, 729; from Bull. Sci. Pharmacol., October, 1913, 584.

**Hyoscyamus and Belladonna.** *Study of the Assays of the German Pharmacopæia.* O. Anselmino has studied the assays that the German Pharmacopæia directs for hyoscyamus and belladonna and for their extracts. He shows that the leaves of belladonna are directed to contain 0.3 per cent. of alkaloids and the extract (yield at least 20 per cent. of original weight of leaves) 1.5 per cent. of alkaloids; hence the relationship between the strength of the leaves and of the extract is what they should be. On the other hand there is a marked discrepancy between the

strength of hyoscyamus and its extract. The drug is directed to contain 0.07 per cent. of alkaloids and it yields at least 20 per cent. of extract; hence the extract should contain 0.07 to 0.20 or 0.35 per cent. of alkaloids. The Pharmacopœia directs, however, that the extract should contain 0.5 per cent. of alkaloids and this in practice is actually obtained. To get at the cause of this anomaly, the following experimental work was done:

A sample of hyoscyamus was found to contain 10.67 per cent. of moisture, 18.21 per cent. of ash and 0.071 per cent. of alkaloids. 500 grams of this drug were extracted with diluted alcohol (sp. gr. 0.8921) and the percolate collected in two portions, the first weighing 2380 grams and the second 1415 grams. The first percolate yielded 104.3 grams of extract containing 0.505 gram of alkaloid. The second percolate gave 22.60 grams of extract containing 0.055 gram of alkaloids. In short, the 500 grams of drug, which by assay contained 0.355 gram of alkaloids, gave percolates which by assay contained  $0.505 + 0.055$  or in all 0.560 gram of alkaloids.

This shows that a percolate or an extract from hyoscyamus gives a higher assay figure than does the drug from which it is prepared and pointed to some weakness in the method of extracting the drug in the official assay. Therefore, the mass left after extracting the drug according to the official assay was dried and extracted with more ether and in this second ethereal extract was found the missing alkaloid. In short, the amount of ether directed for extraction in the assay of the German Pharmacopœia is insufficient to extract all the alkaloids from hyoscyamus, whereas the diluted alcohol used as menstruum in treating the extract does extract all the alkaloid.

Assays of belladonna leaves, the alcoholic percolate therefrom and the extract obtained by evaporation of the percolate show practically the same amounts of alkaloids; hence the ether used in the extraction of the drug in the official assay of belladonna does the work thoroughly. The reason why the ether completely extracts in the case of belladonna and not when hyoscyamus is employed (both drugs supposedly containing the same alkaloid) Anselmino explains by concluding that the alkaloidal combination in hyoscyamus may be different from that obtained in belladonna. —Arch. d. Pharm., 251 (1913), No. 5, 361. (H. V. A.)

**Hyoscyamus.** *Quality on the German Market.*—Anselmino and Gilg have examined both microscopically and chemically the various samples of hyoscyamus of commerce and have come to the con-

clusion that practically none conform with the requirements of the German Pharmacopœia, since most samples have flowers, stems and fruit rather than the leaves only; that most powdered samples are loaded with sand and other foreign matter; that the best appearing specimens are the broad leaves of the sessile leaf cluster of the first year growth instead of the stem leaves from the second year plant; that the first year and the second year leaves can be easily distinguished by means of the microscope; and that the official alkaloidal strength seems based on employment of the entire herb or the rosette leaves of commerce rather than the stem leaves provided for in the official definition and in the microscopical description. —Arch. d. Pharm., 251 (1913), No. 5, 367. (H. V. A.)

**Mandragora.**—*Historical Notes.* Ekert publishes an interesting historical paper on Mandragora or Mandrake root which enjoyed a great reputation in the middle ages as a talisman because of its resemblance to the human form. The article describes the superstitions connected with the collection of it, since it was claimed that when it was pulled from the ground it gave a shriek and that anyone hearing it died instantly. —Schweiz. Wschr. f. Chem. u. Pharm., 51 (1913), No. 29, 425. (H. V. A.)

#### MYOPORINEÆ.

**Avicennia Tomentosa.**—*Lapachol a Constituent of the Heart-wood.*—Dr. K. Bournot has extracted from the heart-wood of this plant a substance melting at 140° which was found to be methobutanyloxynaphthoquinone, and therefore identical with lapachol previously obtained from *Nectandra rhodiæi*, from *Accoma chrysotricha* and from bethabarra wood. The article contains pharmacognostic descriptions of the wood. —Arch. d. Pharm., 251 (1913), No. 5, 351. (H. V. A.)

#### LABIATÆ.

**Hedeoma.**—*Poisoning.* David I. Macht reports a case of poisoning by oil of pennyroyal, with report of some experimental observations, from which the author concludes that the so called emmenagogue oils are by no means innocuous substances, and do not deserve the place among the official pharmacologic preparations which many of them hold. —J. Am. M. Assoc., 1913, v. 61, 105-107. (M. I. W.)

**Lavandula Burmanni.**—*Properties of Volatile Oils from the Leaves and from the Flowers.*—Schimmel & Co. have received from the "Indian Institute of Science at Bangalore" two small samples

of oil, one distilled from the leaves, the other from the flowers of *Lavandula burmanni*, Benth., which were examined by them with results as follows:

**The Leaf Oil** was of a yellow color and had an odor reminding of citral: sp. gr.  $15^{\circ}$ , 0.9131; opt. rot.,  $0^{\circ} 40'$ ; acid val., 9.9; ester val., 36.3; soluble in 1.5 vols. and more of 70% alcohol.

**The Flower Oil** was a pale brown liquid, having very different properties, and showing the following constants: sp. gr.  $15^{\circ}$ , 0.9309; opt. rot.,  $+1^{\circ} 40'$ ; acid val., 1.9; ester val., 115.7; soluble in 1.5 vols. and more of 80% alcohol, but giving only a turbid solution with 10 vols. of 70% alcohol. The oil had a well-defined fenchone odor, the presence of which was determined; owing to the smallness of the available sample, it was impossible, however, to determine whether the fenchone consisted of the active or inactive modification. The constants of these oils obtained at the "Institute" are also given.—Schimmel's Semi-Ann. Rep., October, 1913, 111.

**Origanum.**—*Species Yielding the Commercial Oil.*—Quoting from a recent paper of E. M. Holmes, published in "Perfume and Essent. Oil Record" (3, 1912, 322), Schimmel & Co. observe that *Origanum majorana* (sweet marjoram) was grown as a pot-herb by the ancients, that it is perhaps a native of the Southern Mediterranean region, and that the oil of sweet marjoram of commerce is now chiefly manufactured in Spain. A variety of this species, described by Willdenow as

*Origanum majoranoides*, a photograph of which from material collected in Cyprus and now in the Kew Museum is shown in Mr. Holmes' original paper, is said, together with *Origanum onites*, L., *O. maru*, L., and *O. hirtum*, Lk., to furnish the origanum oil of commerce, although it is probable that other species are also distilled, but of these little is as yet known for certain.—Schimmel's Semi-Ann. Rep., April, 1913, 76.

#### CONVOLVULACEAE.

**Rhodesian Ipomœa Root.**—*Description.*—Prosper H. Marsden gives particulars of a specimen of a root of *Ipomœa* brought by Dr. Yorke from Rhodesia, with the statement that as "the drug has such a powerful cathartic and emetic action, it would be of interest to ascertain the active principle." This rough tuberous root (weighing 260 Gm. and measuring 20 Cm. in length and 24 Cm. in diameter) has external characters corresponding to those of *Ipomœa horsfallii*, described by Power and Rogerson, the hard



ash-gray outer portion bearing warts and dark spots of exuded resin. The inner portion was evidently decomposed, consisting of a black pulverulent mass interspersed with grayish vessels. Both simple and compound starch grains were present in quantity, as well as resin-secreting cells in the cortex. The root was found to contain 61.47 per cent. of moisture. The outer portion exhausted with hot alcohol gave 6.95 per cent. of extractive having an odor of gentian extract. This treated with water left an amount of dark green resin corresponding to 0.85 per cent. of the root. The inner portion treated similarly gave 8.19 per cent. of soft extract and 3.70 per cent. of resin. An endeavor is being made to obtain leaves and flowers of the plant, so as to establish its identity.—Chem. and Drugg., July 12, 1913, 39; from *Annals of Tropical Medicine and Parasitology*, for June.

## BIGNONIACEAE.

**"Bethabara" Wood.** *Presence of a Dye-Stuff Useful as an Indicator*—Otto Raubenheimer directs attention to an interesting dye-stuff contained in the wood known in commerce under the protected name of "bethabara." This wood is derived from a species of *Tecoma*, a tree which grows in British Guiana, attaining a large size, and is valued on account of its exceeding hardness, toughness and close-grained texture, for making bows, fishing rods, etc. The discovery of the dye-stuff was quite accidental and was communicated to the author by Dr. Binford Throne, who found that on washing his hands with soap and water after working with this wood, a beautiful red color was developed evidently from the alkali in the soap. Thinking that "bethabara" might be similar to Brazil-wood as a dye-stuff and indicator, Mr. Raubenheimer first employed the U. S. P. process for making Brazil-wood T. S., but found that the coloring matter is not extracted by water, and that its solution is effected in progressive proportion with alcohol of different strengths—the best solvent being 95% alcohol. The author made several attempts to isolate this coloring matter, but has not yet completed his research. By precipitating an alcoholic tincture with water and setting it aside, a yellow powdery substance precipitates, which when thoroughly washed and dried seems to be the dye-stuff in question, for which he suggests the name

**"Tecomin."** This proves to be a very sensitive indicator, which turns pink with alkalies and yellowish with acids, and is especially sensitive to ammonia. It is a yellow powder, insoluble

in water, but readily soluble in alcohol, pure alcohol being the best.—*Journ. A. Ph. A.*, December, 1913, 1501–1503.

#### APOCYNACEAE.

**Aspidosperma Quebracho.** *Pharmacology of Its Alkaloids.* — *Aspidospermine* is one of a number of alkaloids found in *Aspidosperma quebracho*. Others are aspidospermatine, aspidosamine, hypoquebrachine, quebrachine and quebrachamine. Evidence concerning the action of these individual alkaloids is somewhat conflicting. In general they are said to produce nausea, salivation, increased secretion of mucus in the respiratory tract, depression and alternately rapid and slow pulse. Large doses often cause symptoms of central nervous stimulation, tonic contractions and convulsions.—*J. Am. M. Assoc.*, v. 60, 69. (M. I. W.)

**Callotropis Procera.** *Action of the Trypsin of the Latex and Its Associated Poison.*—C. Gerber and Flourens say that the latex of *Callotropis procera* contains a ferment which coagulates boiled milk, digests casein and fibrin, and is very resistant to heat; it is more active in an alkaline than in a neutral medium. It can be separated only with difficulty by dialysis, and is then much weaker than the original juice. When precipitated by alcohol, it is still less active. It is extremely sensitive to the presence of salts of silver, copper, mercury, gold, or platinum; also to halogens, hydrogen peroxide, and the albuminoids of milk coagulated by heat. The presence of minute traces of these substances will arrest its digestive action, and a quantity which will coagulate boiled milk in three minutes has no action on the same in the raw state. When injected hypodermically into the rat, the trypsin causes a very rapid loss of hair over the site of injection. The epidermis is disintegrated in half an hour, and the dermis appears inflamed and exudes a blood-stained serosity. On incision into the lesion, the cellular tissue is seen to be œdematous and gelatinized with intense vasodilatation; and the muscles in the neighborhood are partially destroyed by the digestive action. But the action is purely local. A scab forms, process of healing sets in, and all the rats treated recover perfectly without showing any functional disturbances. In the guinea pig, however, hypodermic injection of the ferment at first causes no marked local effect, but the respiration is rapidly increased, followed by dyspnœa, convulsive trembling, and paralysis, and death ensues in about thirty minutes. Pigeons, frogs, tortoises, fish, and cuttlefish are also rapidly poisoned by injection with the ferment. Even after the solution has been

heated to 100° C. for thirty minutes it retains its toxic action for these animals, while rabbits and chickens share the rats' immunity from more than local symptoms. The poisonous substance is soluble in alcohol 90 per cent., and the solid extract thus obtained dissolved in physiological solution shows the same selective toxicity and produces precisely similar effects. Not only is there a marked difference in the action of the poison on animals of different classes, but even in such closely allied species among the rodents, as the rat and the cavy; it is fatal only to the latter. The ferment of *Calotropis* cannot be deprived of its toxic substance by treatment with alcohol, since that solvent destroys the enzyme.—Pharm. Journ. and Pharmacist, Nov. 29, 1913, 809; from Compt. rend., 157 (1913), 600.

**Calotropis Procera.**—*The Latex as a New Digitalis-Like Cardiac Remedy.*—By his chemical and pharmacologic investigations of the latex of *Calotropis procera*, a plant indigenous to tropical Asia and Africa, L. Lewin has added a new and apparently valuable cardiac remedy, similar in its action to digitalis, to the medical armamentarium. In its native home it has long been valued as a remedial plant and for economic purposes, and also as an arrow poison. In the fresh state the latex resembles the milk of animals. Like this it forms a coagulum, which separates in clots surmounted by a slightly turbid whey, but unlike animal milk may be kept for years without undergoing decay or becoming mouldy, or losing its activity, the only change being that of coagulation. It has an undefinable but characteristic odor. The coagulation can also be produced by the addition of alcohol or acetone to the latex, whereby a separation of the solid portion from the whey,

**Calotropis Serum**, is readily effected, the latter a slightly turbid, or also a golden yellow perfectly clear fluid, while the solid portion consists of a resinous body,

**Alban**, which when purified has the composition corresponding to the formula  $C_{16}H_{27}O$ , a body which is not concerned in the pharmacologic activity of the latex, this residing exclusively in the liquid portion or serum. On heating the serum gently a coagulum of albumen is deposited, which also is devoid of cardiac activity, but on evaporating the clarified serum, the active constituent, for which the name

**Calotropin** is proposed by the author, is separated, composing after purification an amorphous body, which rapidly becomes

glutinous on exposure to the air and is readily soluble in water, forming a neutral solution. Subcutaneous administration of 1 to 3 milligrams of this substance in aqueous solution to frogs, is followed by cardiac peristalsis in about 3 minutes and complete systolis of the heart's action within 6 minutes. Lewin, however, does not advise the use of the isolated "Calotropin," but recommends the administration of the serum obtained by removing from the calatropis latex the resin, the albumin, and the saline constituents. So prepared "Calotropis serum" may be used both subcutaneously and per os, and will retain its activity undiminished for years. Pharm. Ztg., lviii (1913), No. 17, 168; from Med. Klin., 1913, No. 6.

**Condurango Bark.** *Medicinal Value and Uses.* Dr. P. E. Hommell calls attention to the value of condurango bark in the treatment of gastric ulcer, "not because it has any effect upon the course of the disease, but because it improves the general condition of the stomach of cancer patients; good observers find that its judicious exhibition materially increases the appetite and improves the digestive function, it also relieves gastric pain and alleviates or arrests vomiting; it also, to some extent, increases the production of gastric juice and augments the flow of bile and pancreatic juice." The important thing, in his opinion, is first of all to obtain in good condition the genuine drug and second to properly exhibit the drug in order to secure its best effects. He objects to its administration in the form of wine, elixir, tincture or compound tincture, these forms being contra-indicated in cases where the drug is indicated. He recommends a *Mistura Condurango et Ulmi* and a fluidglycerate of Condurango as being admirable preparations of the drug, with the following formulas for their preparation:

**Mistura Condurango et Ulmi.**

Fluidextract Condurango.....	25	Cc.
Magnesia Carbonate.....	2.50	Gms.
Glycerin .....	25	Cc.
Mucilage of Elm (10%), enough to make....	100	Cc.

Rub the fluidextract condurango in a mortar with the magnesia carbonate and the glycerin, then add 50 Cc. mucilage of elm and filter. Dose, one or two teaspoonfuls.

**Fluidglycerate of Condurango Bark.**—Condurango bark in No. 40 powder 100 Gm.; proceed according to Beringer type process for fluidglycerates, using 100 Cc. of the glycerol water menstruum



to moisten the drug. Dose: 15 to 30 drops. Proc. N. J. Phar. Assn., 1913, 80-83. (E. C. M.)

**Curare.**—*Investigation of Different Lots.* Meillière, in the course of an examination of different lots of curare from various sources, found a great variation in their activity, some being ten times more active than others. By the use of perchloric acid or of the alkali salts of that acid, the perchlorates of the mixed curare bases may be obtained as an insoluble precipitate. When treated with methyl alcohol this may be separated into two portions, one of which affords slender needles, melting at  $230^{\circ}$  C. with decomposition, the other forming an amorphous mass. The name "urarine" is proposed for the base yielding the crystalline perchlorate. Urrarine exerts distinctly the typical curare action, but more particularly on warm-blooded animals. The total curare action is more pronounced on cold-blooded animals. Pharm. Journ. and Pharmacist, September 13, 1913, 397; from Journ. de Pharm. et Chim., 1913, 7, 182.

**Nux Vomica.**—*Improved Method of Assay.* A. Azadian finds the usual titration assay of *nux vomica* unreliable and recommends in its stead precipitation with silico-tungstic acid. The process he recommends is as follows: The powdered *nux vomica* (10 grams) is extracted in a Seiler apparatus with a mixture of 25 grams of chloroform and 50 grams of ether, to which is added 5 grams of ammonia (strength not given). The mixture is macerated for two to three hours with frequent agitation, the clear liquid is poured off and the extraction with ether-chloroform-ammonia is repeated two or three times until the fluid shows no trace of alkaloid. The mixed fluids are filtered, the excess of chloroform and ether is distilled off and the remaining fluid is poured into a separatory funnel containing 10 per cent. nitric acid. The diluted acid is separated from the ether-chloroform layer, which is then shaken out several times with distilled water, these aqueous layers being finally mixed with the acidulated solution and after the adhering ether and chloroform is driven off at water bath heat, the alkaloids are precipitated from the acid solution by addition of 10 cc. of a 5 per cent. silico-tungstic acid, followed by 10 cc. of 10 per cent. nitric acid. After heating the mixture to facilitate separation of the silico-tungstates of strychnine and brucine, the precipitate is collected on a quantitative filter, washed with distilled water until the washings are no longer acid, the paper and precipitate dried, transferred to a crucible and calcined and the

residue of  $\text{WO}_3\text{SiO}_2$  is weighed. This weight multiplied by the proper coefficient (0.4984) gives the weight of total alkaloids.

The paper gives experimental proof that the residue on calcination is  $\text{WO}_3\text{SiO}_2$ , and explains how the coefficient given above was deduced. It closes with a table showing results of assays of 11 samples of tincture of *nux vomica*, four samples of the extract, four samples of the powder and three samples of extract, all performed by the method just given. —Schweiz. Wschr. f. Chem. u. Pharm., 51 (1913), No. 50, 761. (H. V. A.)

**False Nux Vomica Seed.** —*A New Kind Derived from Burmah.* —James Small describes a new kind of *nux vomica* seed recently sent from Burmah and offered to manufacturers, which on examination was found to contain no strychnine. The seed is of a light gray color externally and yellow internally—the yellow endosperm being much lighter in color than that of *Strychnos nux vomica*, which is usually dark gray and more translucent. The outer surface is densely covered with closely appressed hairs. The seed is flattened, round, or elliptical, and has a ridge around the edge where the two disc-shaped masses of the endosperm meet. There is no trace of bitterness to the taste. The microscopic characters of the false seed, which are described with an illustration of radial transverse sections of both true and false seeds, show no distinct difference; nor were there any differences observed on treating the sections with chemical reagents. That the false seed contains no strychnine is sufficiently demonstrated by the total absence of bitter taste. There is no doubt, however, that the false seeds are derived from a species of *Strychnos*, but it has not yet become possible to determine the species yielding them. —Pharm. Journ. and Pharmacist, April 12, 1913, 510.

**Strophanthus Seed.** *Oil Content.* While the G. P. IV directed the preparation of tincture of strophanthus from seeds deprived of fat, by expression, the G. P. V now directs its preparation from the powdered natural seed. It is found, however, that tincture so prepared becomes turbid on even a very moderate reduction of temperature, whereas the tincture prepared as directed in the 4th edition remains permanently clear. The firm of J. D. Riedel finding but meagre information in the literature concerning the oil content of strophanthus has caused a number of commercial samples to be examined, as follows: Two Gm. of the sample, previously crushed, were macerated with frequent shaking in a stoppered bottle during 24 hours, at the ordinary temperature, with 50 Gm.

of petroleum ether (b. p.  $40^{\circ}$ – $60^{\circ}$ ); the solution was filtered into a tared dish, the residue on the filter washed several times with petroleum ether, the filtrate and washings evaporated at a gentle heat, and the residue dried to constant weight at  $80^{\circ}$  C. In this way the samples yielded on an average 32% of fixed oil, in which none of the active constituents of the seeds could be detected. Pharm. Ztg., lviii (1913), No. 27, 267; from Riedel's Berichte, 1913.

**Strophanthus Gratus.**—*Preparation and Properties of an Acid Saponin, g-Strophanthic Acid.*—E. Sieburg reports on a saponin having decided acid properties, which he has isolated from *Strophanthus gratus* and has named

**g-Strophanthic Acid.**—It was obtained from the seeds, deprived of fat with petroleum ether, by extracting them in a Soxhlet for ten hours with 70 per cent. alcohol, concentrating the extract, diluting with water, and adding a few drops of acid, whereby crude strophanthic acid is precipitated. This when purified has the following properties: When neutralized with alkali it froths strongly. It is not precipitated by tannic acid, but gives precipitates with salts of copper, zinc, lead, iron and barium, without, however, forming true salts. In water it is soluble in the proportion of 1 : 1250; in 70 per cent. alcohol, 1 : 25; in 96 per cent. alcohol, 1 : 50; in ether, 1 : 800 parts. The elementary analysis combined with the molecular study leads to the formula  $(C_{21}H_{34}O_{10})_4$ . On hydrolysis, g-strophanthic acid is split into glucose and

**Strophanthigenin** in form of fine needles, melting at  $294^{\circ}$ , and having the composition  $(C_{12}H_{18}O_2)_2 \cdot 3\frac{1}{2}H_2O$ . In its color reactions g-strophanthic acid (which is present also in the seeds of *Strophanthus Kombé* and *S. hispidus*) shows a certain conformity with those of cholestrin (phytosterin).—Pharm. Ztg., lviii (1913), No. 49, 484; from Ber. d. Pharm. Ges., 1913, No. 4.

#### STYRACEAE.

**Siam Benzoin.**—*A Half-Century's Attempts to Trace Its Botanical Source.*—The numerous efforts during recent years to determine the botanical source of Siam benzoin are interestingly illuminated by an account of the difficulties encountered by E. M. Holmes in his own experience, covering a period of fifty years. He says that as long ago as 1859 the late Daniel Hanbury wrote to Sir R. H. Schomburgh, then British Consul at Bangkok, asking him to find out, if possible, if the tree that yields Siam benzoin was



really *Styrax benzoin*, Dryand. But first-hand information and botanical specimens could not then be obtained, and at Mr. Hanbury's death in 1875, and even at the date of publication of the second edition of "Pharmacographia" in 1879, the problem remained unsolved. In 1883, Mr. Holmes made an attempt to carry on the inquiry. Omitting details, which should be consulted in the original article—together with the figures illustrating the microscopic and macroscopic distinctions observed in the organs of flowers and fruits of the several species of *Styrax* that have been mentioned as the probable source of Siam benzoin—the following results of his inquiry may here be mentioned in brevity:

Corresponding with Mr. R. Jamie, at Singapore, asking him if he knew of any correspondent in Siam who could obtain specimens of the plant yielding the Siam benzoin, Mr. Holmes received a leafy twig of a tree which Mr. Jamie had grown in his garden from a seedling forwarded from Luang Prabang, in the neighborhood of which, according to reliable information it grows profusely, the tree being indigenous in the Northern Laos States in which Luang Prabang is situated and known to yield the Siam benzoin of commerce. So far as Mr. Jamie could judge from the appearance of the tree as compared with one of *Styrax benzoin*, also growing in his own garden, he considered them distinct species, and subsequent comparison of sections of the leaves of Mr. Jamie's specimen and an authentic specimen of *Styrax benzoin* from the Society's Herbarium, proved that there were some differences in the structure of the leaves of the two plants. Pursuing his investigations, after an unsuccessful attempt to obtain specimens from a tree which had flowered and fruited, Mr. Holmes (1893) secured specimens of leaf and flower of a *Styrax* collected by Thorel near Luang Prabang in 1866, and of *Styrax benzoin*, for comparison, from which it became evident that the *Styrax* of Thorel is a distinct species, belonging to the subgenus "Anthostyrax," while *Styrax benzoin* is referred (by Dr. Pierre from whom the specimens were received) to the subgenus "Plagiospermum." The new species has been named by Craib *Styrax Tonkinense*. Meanwhile, a report by Mr. Beckett on the trade of Siam for 1893, was published in 1895, in which the statement appeared that Siam benzoin is obtained from an extremely circumscribed area on the east of the Mekong; but it was not until 1906, when a new Director was appointed to Kew Gardens, that Mr. Holmes again solicited aid in obtaining fruiting specimens of the Siamese benzoin tree, with the result that flowering specimens were obtained of a tree growing in North-



west Siam, which was stated by the natives to yield benzoin. The arrival of fruiting specimens proved this to be an entirely different species, which was described by Mr. Craib in 1912 under the name of *Styrax benzoides* (see Year Book, 1912, 172). The evidence adduced from Mr. Holmes' inquiry seems to indicate: first, that the chief, if not the only source of Siam benzoin of commerce is *Styrax Tonkinense*, Craib, which is found in the district between Luang Prabang and Hanoi; second, that the *Styrax benzoides* of North-west Siam yields a fragrant resin, used locally, but the evidence that it yields any of the Siam benzoin of commerce is not equally satisfactory; third, that the method of preparation with hog's marrow, described by Rordorf recently, would account for the characteristic appearance of Siam benzoin, but it is not yet quite clear whether this method is applied in Siam to the product of *Styrax benzoides*.—Pharm. Journ. and Pharmacist, November 29, 1913, 804-806.

**Siam Benzoin.**—*Fraudulent Extraction of Benzoic Acid.*—W. Beckers confirms the observation heretofore made that Siam benzoin is occasionally offered on the market from which the benzoic acid has been extracted. In a recent case that came under his observation the benzoic acid had been removed by distillation and partially replaced by synthetic acid. It follows that when benzoin is offered at abnormally low figures it should be regarded with suspicion. The author adds the recommendation that pharmacists prepare benzoic acid themselves, and that the official tests with potassium permanganate be made more exacting. —Pharm. Ztg., lviii (1913), No. 19, 190; from Zentralbl. f. Pharm., 1913, No. 9.

#### COMPOSITAE.

**Dicoma Anomala.**—*Chemical Examination.*—F. Tutin and W. J. S. Nauton have subjected *Dicoma anomala*, Sond., to chemical examination. This small South African plant is known by the Kaffir name of "in-nyongwane," and is reputed to have medicinal value, the powdered root being administered for colic. A very singular purpose also is, that when a Kaffir goes to a strange place, he chews a little of the root, in the belief that, if he then eat of any poisoned food, he will immediately vomit it. The material used for this examination consisted of the entire air-dried plant, which had been specially collected for this purpose. The greater part of the material consisted of the thick, woody roots, the leaves and stem being thin and small. The results of their examination, the

details of which are given, are summarized by the authors as follows:

An alcoholic extract of the plant, when distilled in a current of steam, yielded a small amount of an essential oil. The portion of the extract which was soluble in water yielded a small amount of a colorless crystalline glucoside, which appeared to possess the formula  $C_{39}H_{58}O_{17}$ , and a large amount of a yellow amorphous product, which, on hydrolysis with alkali, gave 3 : 4-dihydroxycinnamic acid. The aqueous liquid contained, furthermore, a quantity of sugar which yielded *d*-phenylglucosazone, melting at  $218^{\circ}$ .

The portion of the extract which was insoluble in water, formed a dark-colored, resinous mass. It consisted largely of amorphous products, some of which gave 3 : 4-dihydroxycinnamic acid on hydrolysis, and a small amount of an amorphous alkaloid was also present. The following definite substances were, however, obtained from the resin: (1) Hentriacontane,  $C_{31}H_{64}$ ; (2) a phytosterol,  $C_{28}H_{46}O$ , which melts at  $159^{\circ}$ , and seems to be a lower homologue of stigmasterol; (3) palmitic, stearic, arachidic, cerotic, and melissic acids, together with some unsaturated acids which appeared to consist chiefly of a compound,  $C_{16}H_{30}O_2$ , such as has been obtained by Bull (1906) from cod liver oil.—Pharm. Journ. and Pharmacist, May 17, 1913, 694-696.

**Folia Farfaræ.**—*Morphological Distinctions between Shade-Grown and Sun-Grown Leaves.*—W. Ungerer mentions that among domestic medicinal plants that are capable of developing a sunlight and shade form, coltsfoot leaves (*Tussilago Farfara*) lend themselves particularly well to a study of the morphological distinctions due to these influences. Thus the shade- and sun-leaves of the coltsfoot are distinguished markedly by the different lengths of their stems, which in typical shade-leaves is 22.8 Cm. on the average, in sun-leaves only 12.4 Cm. The sun-leaves are further characterized by the violet color of their stems and of the nerves on the upper surface. The difference in thickness of the shade- and sun-leaves is due almost exclusively to the degree of development of the palisade parenchyme, but this in sun-leaves is never confined to three layers and consists uniformly of four. On complete drying 100.0 of shade-leaves yield 8.12 per cent. of dry substance; 100.0 of sun-leaves yield 10.05 per cent., while the ash from shade-leaves, calculated on the dry substance, amounted to 18.2 per cent., and that of sun-leaves to 22.8 per cent. The development of the coltsfoot is therefore not favorably influenced in shady

situations; consequently, to secure strictly first class "folia farfaræ," these should only be collected from plants having free exposure to the sun.—Apoth. Ztg., xxviii (1913), No. 57, 536-537.

**Inula Helenium, L.** *Phytomelan a Constituent of the Rootstock.*—Phytomelan, a black, carbon-like substance, devoid of nitrogen, but containing 70-76% of carbon, has heretofore only been found in plants belonging to the Compositæ, mostly in the fruit walls, and with the single exception of *Perezia-root*, never in the subterranean portion of the plant. C. Griebel has now discovered this peculiar substance in the rootstock of *Inula helenium*. It is located in the cortical portion, and particularly in that of old rootstocks, but is present in most of the elecampane roots of commerce. The author failed to find phytomelan in the roots of any other compositæ on the German market, and suggests, therefore, that its presence may serve for the identification of elecampane as an adulterant of drug powders. Pharm. Ztg., lviii (1913), No. 49, 484; from Ztschr. f. Unters. d. Nahr. u. Genussm., xxv (1913), No. 9.

**Insect Powder.** *Cultivation of Flowers Securing Efficiency, etc.*—Supplementary to his previous paper (see Year Book, 1912, 177), P. Siedler describes the method modernly adopted for securing the most efficient insect flowers. Selecting, as far as practicable, virgin soil, this is prepared by lightly hoeing to the depth of 20 to 30 Cm. and during the first rain in September spreading crushed flowers, which are hoed under to the depth of about 5 Cm. The young plants appearing in the following spring are left undisturbed during the first year, being at most freed from weeds, if necessary. A few flowers only are produced during this period, but during the second and third years an abundant crop is produced, provided rains set in at the proper time, while during the fourth year the crop is quite insignificant and is no longer remunerative. By this method the flowers produced, although not as elegant, by far exceed in strength the handsome flowers cultivated by the method practiced on the Istrian islands in the neighborhood of Fiume, which yields not only more perfect flowers and also larger crops, though greatly inferior in activity.

The adulteration of insect powder is modernly confined almost exclusively to the admixture of powdered stems, the addition of other flowers being now rarely resorted to. The author finds that the determination of the ether extract, originally recommended by Thoms affords the best criterion of quality, but is best carried



out with the aid of a Soxhlet, and supplemented by the determination of the volatile components. Determinations made in this way gave between 6.13 and 7.4% of dry ether extract and from 1 to 1.5 % of volatile components.—Pharm. Ztg., lviii (1913), No. 33, 329; from Riedel's *Berichte*, 1913.

**Insect Powder.**—*Ash Content.*—Wiebelitz has recently determined the ash content in two specimens of insect powder, with a yield of 4.7 and 5.1%, respectively, and, therefore, doubts the correctness of the statements of higher figures found in the literature. In the laboratory of Riedel, however, the low figures of Wiebelitz were not obtainable. The average ash content of ten specimens of insect powder, ground from flowers in Riedel's laboratory, was 7.6% and the percentage of ash insoluble in acid was only 0.14%.—Pharm. Ztg., lviii (1913), No. 33, 329; from Riedel's *Berichte*, 1913.

**Santonica.**—*A Santoninless Specimen.* A specimen of santonica was recently submitted to Prof. Chas. H. LaWall for examination and assay which, while it corresponded closely in appearance with the official santonica in most respects, showed some abnormal characteristics, and upon further examination was found to contain not more than traces of santonin.

The appearance of the drug was very favorable as to color and freshness. It was rather greener than the santonica commonly seen, and possessed an odor slightly different from the ordinary santonica odor and strongly suggestive of tansy. The microscopic examination showed it to be more tomentose than the drug usually is, and the oil glands were of a greenish color. The drug was assayed by several methods, proven to be accurate, but all of them gave a small amount of a resinous residue which showed no signs of crystallizing, even after several days' standing, while several commercial specimens, assayed simultaneously, yielded well crystallized santonin. Nevertheless, this santoninless sample must be regarded as normal and was proven not to have been tampered with in any way, such as being exhausted for example.

It is possible, therefore, that santoninless santonin may be of more or less frequent occurrence on the market, and the following simple test, which is applicable to the drug direct, may, therefore, prove serviceable:

Place 0.5 Gm. of santonica (whole or ground) in a test tube, add 5 Cc. of spirit of nitrous ether and boil gently. No color should be developed or not more than a slight, greenish yellow color due



to the solvent action of the alcohol on the resins of the drug. Now add 10 drops of alcoholic potassium hydroxide solution and again boil. In an active drug a rose red color is developed in direct proportion to the amount of santonin present. In the sample under question, scarcely any color was noticeable at all, while the other samples gave results agreeing proportionately with the amount of santonin found by assaying.—*Journ. A. Ph. A.*, May, 1913, 596-597.

**Wormseed.**—*Adulteration.*—A number of cases of adulteration of *Flores Cinæ* have been reported during the last few years. Bieber, of Hamburg, mentions that a drug is offered which resembles wormseed in its physical appearance, but which does not contain a trace of santonin. This adulteration is absolutely worthless and it is, therefore, necessary to assay the wormseed for its santonin content. An assay for wormseed was given in the yearly report of Cæsar and Loretz.—*Pharm. Ztg.*, 1913, No. 13, 129. (O. R.)

#### VALERIANACEÆ.

**Valerian Root.**—*Microscopy.* According to the researches of Dr. W. Unger the oil drops in the cells are covered with an extremely thin skin of unknown composition. Similar appearances occur in several other drugs containing ethereal oils.—*Apoth. Ztg.*, 1912, No. 103. (O. R.)

#### RUBIACEÆ.

**Cinchona.**—*Valuation.*—On the basis of comparative investigations of various methods in use for the valuation of cinchona bark, L. Plovart and C. Vallée recommend the following: 7.0 Gm. of the powdered bark, dried at 100°, is shaken in a 200 Cc. flask with 140.0 Gm. of chloroform and 10.0 Gm. of diluted ammonia and allowed to stand with frequent agitation during 3 hours; then 3.0 Gm. of powdered tragacanth and 20.0 Gm. of water are added, the mixture is vigorously shaken, and after standing one hour 100.0 Gm. of the chloroformic solution (= 5.0 Gm. bark) is filtered off. The chloroform is distilled, the residue dissolved in 5 Cc. of alcohol with gentle heat, the solution added to 15.0 Cc. of 0.4 per cent. hydrochloric acid, rinsed into a separator with 5 Cc. more of alcohol and shaken out twice with 25 Cc. of ether. The acid solution is filtered through a moistened filter and rinsed with 10 Cc. of water; the ether is shaken out with 15.0 Cc. of 0.4 per cent. hydrochloric acid and twice with 10 Cc. of water, the acid aqueous liquids, after filtration, being freed from ether held in solution by heating on the water bath. The united aqueous fil-

trates are then adjusted to 100 Cc., and the alkaloids in 20 Cc. of this solution are precipitated with silicotungstic acid.—Pharm. Ztg., lviii (1913), No. 95, 750; from Journ. de Pharm. et Chim., 1913, vol. 7, 118–120.

**Roasted Coffee.**—*Harmful Constituents.*—The disturbances of the digestion which follow excessive coffee drinking are not considered by J. Burmann to be due in any degree to the caffeine, but solely to certain volatile constituents formed, and only partly volatilized, during roasting. These are named *cafeotoxin*, and may be eliminated by submitting the roasted coffee to successive treatment with steam under pressure of several atmospheres, followed by exposure under a vacuum. The coffee thus treated is called “atoxicafé.” It retains its caffeine unaltered. It differs from ordinary coffee only in containing less cafeotoxin. Cafeotoxin has a marked reducing action on hæmoglobin, a hypotensive action on the circulation, a depressant action on the central nervous system, occasioning cardiac arrhythmia, and on the respiratory centers, causing dyspnœa.—Pharm. Journ. and Pharmacist, October 11, 1913, 533; from Journ. de Pharm. et Chim., 1913, 8, 281.

**Ipecacuanha.**—*Examination of Old Samples of the Powdered Drug.*—Ehren reports the results of an examination of three old samples of powdered ipecacuanha, of 1901, 1902 and 1903, and, for comparison, a sample of 1912. All the old samples had been preserved in paraffined bottles and were somewhat discolored. The alkaloidal determination was made by the method of the 1908 Codex, and resulted as follows: 100 Gm. of the powder, dried at 100°, yielded: 1901 powder, 2.904 Gm.; 1902 powder, 2.66 Gm.; 1903 powder, 2.88 Gm.; 1912 powder, 2.882 Gm. of alkaloid. It follows that, with rational preservation, powdered ipecacuanha does not suffer any loss in alkaloidal content. The author, however, suggests that the chemical examination of the powder should be supplemented by a physiological test.—Pharm. Ztg., lviii (1913), No. 33, 329; from Journ. de Pharm. et Chim., 1913, No. 4.

#### CAPRIFOLIACEAE.

**Viburnum Opulus.**—*Market-Supply Said To Be Acer Spicatum.* *Changes Suggested in Pharmacopœial Specifications.*—Oliver A. Farwell says his attention was directed to the lack of agreement between the commercial *Viburnum opulus* and the pharmacopœial description, by Nathan S. Satter, who stated that the bark supplied for *Viburnum opulus* was mountain maple (*Acer spicatum*,

Lam.). Authentic specimens of each were collected during the summer of 1912, when examination and comparison with commercial cramp-bark proved conclusively that commercial cramp-bark is obtained from mountain maple. Immediate investigations of the entire markets of this country and Europe were made, which confirmed the statement that the bark of the *Viburnum* species is not now collected, the entire market supply being from *Acer spicatum*. It seems, that as long ago as the early nineties *Acer spicatum* was mistaken for cramp-bark; for according to a paper on the subject of the distinctive characteristics between *Viburnum prunifolium* and *Viburnum opulus*, by the U. S. P. revision committee, reproduced in the American Journal of Pharmacy, the illustrations of the internal structure show conclusively that the bark had for investigation, was not *Viburnum Americanum* but *Acer spicatum*. Compared with the pharmacopœial description, the bark of mountain maple is identical but the bark of *Viburnum Americanum* differs in that the quills are smaller and half as thick; externally, the bark is not so harsh to the touch, being covered with a softer grayish brown to silver gray periderm and the brownish lenticels are very small and well scattered; the inner surface is much lighter and not so striated; the fracture is even, not fibrous; the bark is easily and readily broken, that of the maple is tough; the principal distinction is seen in the cross-section, the viburnum being determined by the absence of bast layers, so characteristic of the maple and by the presence of large numbers of rosette crystals of calcium oxalate in the parenchyma cells. Further technical description is given of the viburnum bark, petiole and leaf. The author concludes that true viburnum barks have not been found on the American markets for the past twenty years and probably never were; that the bark investigated by the pharmacopœial revision committee was *Acer spicatum*, Lam.; and that the bark admitted to the Pharmacopœia under the title *Viburnum opulus* is that of *Acer spicatum*. He suggests continuing the present title and description, except as to source, which should be from *Acer spicatum*, and cites such a precedent in wild cherry or *Prunus virginiana*. The article is accompanied by fourteen cuts illustrating the points of difference between *Viburnum opulus* and *Acer spicatum*. Bull. Pharm., February, 1913, 65, 70. (C. M. S.)

## UMBELLIFERÆ.

**Russian Anise.**—*Cultivation and Trade.*—According to particulars respecting the cultivation and trade in Russian anise, communicated to Schimmel & Co. by the "Handelsgesellschaft Anis," of



Alexievka, anise is grown in the county of Voronetz, in the districts of Biriutch, Ostrogojsk, and Valuiki. The seed was originally introduced from Spain by a Prince Tcherbatoff and experimentally cultivated by him on his estate at Krasnoic (district of Valuiki), whence its cultivation gradually extended until it covered a radius of about 200 versts, within which it has remained restricted for many years. Experiments in anise-growing further north and south have been unsuccessful owing to climatic conditions; in the north because of the long time which anise requires to reach maturity (about  $4\frac{1}{2}$  months in the climate there prevailing), and in the south because the anise will not develop fully owing to the great heat and drought. It is therefore only possible to grow the plant within certain zones where the climatic conditions approximate to those of Voronetz (av. temperature about  $15^{\circ}$  C. in April,  $18^{\circ}$  in May,  $20^{\circ}$  in June and July, and  $18^{\circ}$  in August). The selection of soil, the details of planting, cultivation, and harvesting are given, but must be consulted in the original. Within a week after the gathering the ripening of the fruit is completed, and the seed is then threshed on a clayed floor, mostly with flails, and is cleaned by winnowing—the average yield per desiatine being from 40 to 50 poods—but rarely effectively. The seed is of a grayish green color. Quite green seed is obtained when the anise is harvested in an unripe state; but it is extremely rare to find anise of a quite uniform color, more or less dark seed, usually that of the central flowering-head, being generally present. Anise loses considerable weight by storage, reckoned at 2% per year, and also from 0.1 to 0.2% of oil during the same period, while the greenish tint changes more to yellow as it ages. —Schimmel's Semi-Ann. Rep., October, 1913, 22-27.

**Asafetida.**—*Characters of the Packages and Contents as Imported.* Henry G. Greenish observes that at a recent drug sale (in London) one of the most interesting items was an unusually large quantity of asafetida, no less than 889 cases (a record quantity) being offered. This gave a favorable opportunity, of which he availed himself, for examining the manner in which it is exported and the characters of the drug as it arrives. Asafetida is exported chiefly from the Persian Gulf ports, such as Bunder Abbas, Bushire, etc., and from Bombay; but that which reaches London comes almost entirely from the Persian Gulf. It usually arrives in wooden cases holding from 28 lbs. to 12 cwts., 28 lbs. to 2 or 3 cwts. being common sizes, the empty packing cases in which other goods have arrived—in this particular instance many Swedish match



cases being used for this purpose. These cases are commonly wrapped in waterproof tarred canvas, and this is surrounded by an outer covering of sacking; about one-third of the cases, however, are tin-lined and from these the waterproof covering is omitted. A small proportion of the drug is packed in goat skins with the hair still on them. These are usually enclosed in bags of sacking and packed in cases without tin linings.

Asafetida is usually delivered at East Quay, London Dock, where, on the quay, outside of the warehouses but sheltered by a roof, each case is opened and the asafetida placed on the floor of the warehouse, care being taken to keep all the cases of the same export-mark together, but roughly arranged according to their quality—the empty cases being coopered up and marked for identification, the drug being returned into them after the sale. The paper is illustrated by eight photographs, showing the different kinds of packages and the method of exposing their contents for inspections, the characters of their contents so exposed being described. The author concludes that few drugs vary so much in their physical characters as does asafetida. While the bulk is in nodules, loose or more or less blocky, some arrives in the condition of a uniform, firm, kneadable, or softish mass, which in one case (of skins) was of about the consistency of honey, but comparatively little of the drug is in fine tears. *Pharm. Journ. and Pharmacist*, May 24, 1913, 729-731.

**Asafetida.**—*Determination of the "Lead Number" Standard.*—J. R. Rippetoe says that, though the "lead number" standard for asafetida (proposed by Merrill and Seil in 1912), and its application as a test for freedom from, or limit of foreign gum resins, in passing ports of entry, has been criticized by several well-known chemists, the method of determining the "lead number" does not seem to have been closely studied. In making some preliminary experiments upon selected tears of asafetida, Mr. Rippetoe found the values to vary as much as 66 upon the same sample, and he now gives results supporting his claim that the method is subject to too many variations to be relied upon for determining the "lead number" of either selected tears of asafetida or possible mixtures of asafetida and other gum resins. The results show that the lead absorption is subject to considerable variation. Several of the factors which seem to have more or less influence are: failure to obtain constant weight by drying at 110° C. for five hours, and the effect of heat. The strength of the lead acetate solution and the alcohol for dissolving the dried resin are within control.

The use of 80 per cent. alcohol instead of 95 per cent. greatly reduces the absorption, and the number obtained upon asafetida tears is much below the recently published figure.—*Amer. Journ. Pharm.*, May, 1913, 199.

**Fetid Gum Resins.**—*Botanical Source.*—At the suggestion of Mr. E. M. Holmes, some authentic fruits from asafetida-yielding species of *Ferula*, supplied by him from the Herbarium and Museum of the Pharmaceutical Society, were subjected to microscopic examination by Mr. James Small for the purpose of a comparison of their microscopic structure with that of fruits occurring in commercial asafetida and with the hope that the controversy respecting the source of the two varieties of the drug—the *white* and the *red*—might thereby be definitely settled. Transverse sections were taken of the mericarps of the fruits (below mentioned) as near the middle as possible, in order to avoid the variations produced by the branching of the vittæ, the following being shown by cuts and described in the author's paper:

*Ferula fatida*, Regel; *Ferula narthex*, Boiss; *Ferula fatidissima*, Regel and Schmalhausen; *Ferula jäschkeana*, Vatke; *Ferula teterrima*, Karelin and Kirilow; *Ferula alliacea*, Boiss; *Ferula rubricaulis*, Boiss.

These fruits are all ovoid or flattened, with wings, which vary in width according to the species. In the figures the vascular bundles of the primary ridges and those of the commissural surface are indicated by dense hatching enclosed by a line.

The fruits found in two commercial specimens of asafetida—the one composed exclusively of white tears (Specimen No. 1), the other (No. 2) a mixed specimen, composed of both white and red gum resin—were examined in the same way, and the microscopic sections compared with those of the fruits described as authentic specimens. The results showed conclusively that the sections of the fruits found in Specimen No. 1 were identical with each other, and identical with the sections of the fruits of *Ferula rubricaulis*, but that the fruits found in Specimen No. 2 are of two kinds, the one kind identical with the fruits of *Ferula rubricaulis*, while the section of the others proved to be identical with that shown by the fruits of *Ferula fatida*. Since, therefore, it has been shown that the white variety of asafetida is derived from *Ferula rubricaulis*, and that the mixed gum contains some fruits of the same species, it is evident that the red variety of asafetida is derived from *Ferula fatida*. This corroborates Dr. Aitchison's observation of the collection of the red variety from plants of *Ferula fatida*. In a

note following this paper, Mr. Holmes substantially endorses the findings of Mr. Small.—Pharm. Journ. and Pharmacist, March 1, 1913, 287-290.

**Meum Athamanticum.**—*Volatile Oil from the Herb.*—While the volatile oil from the root of "bald money" (*Meum athamanticum*, Jacq.), is known, the volatile oil from the herb has hitherto not been described. Schimmel & Co. have now distilled from the herb of bald money collected in the Hartz Mountains an oil of a deep reddish brown color with a celery-like odor, in a yield of 0.88 per cent. It was soluble in 3 vols. of 90% alcohol; sp. gr., 0.9053; refr. index, 1.50327; acid val., 8.8; ester val., 63.1. Its dark color made it impossible to determine the optical rotation of this oil. White crystals separated from the oil which at first melted at 83° to 84°, and, after being once crystallized from alcohol, at 91°. They possibly represent guajol.—Schimmel's Semi-Ann. Rep., April, 1913, 111.

**Pastinaca.**—*A Reputed Dermatic Poison.*—The circumstance that cases have repeatedly been reported of persons who had collected pastinac (*Pastinaca sativa*, L.) having contracted acute dermatitis of the hands, has induced A. Nestler to make experiments upon his own person on the toxicity of the plant, as well as of the closely allied *Pastinaca opaca*, Bernh., previous investigations into plants with an irritant action upon the skin having convinced him that he himself is highly sensitive to dermatic poisons. He placed green leaves, parts of stalks, as well as fruits of the plant upon sensitive parts, rubbed the parts vigorously with the hairy leaves and stalks, and applied extracts produced with water, alcohol, ether and chloroform, but in no instance was any ill-effect observable. He can account for the untoward effects experienced by the collectors only by the presence of insects—such as mites and caterpillars—containing some irritant constituent.—Schimmel's Semi-Ann. Rep., April, 1913, 78; from Ber. d. deutsch. bot. Ges., 30, 581.

**Persian Cumin Seed.** *Botanical Source and Characters of Volatile Oil.*—A parcel of cumin seed from Persia, offered some time ago on the London market, yielded to Schimmel & Co. upon distillation 2% of an oil possessing the following constants: sp. gr., 0.911; opt. rot., +7°; refr. index, 1.4980. The oil contained 18% of aldehydes by the bisulphite method and its odor was sweeter than that of ordinary cumin oil.



According to Holmes, Persian cumin seed is known in Bombay as *Lecrah Siah*, the ordinary seed from *Cuminum cyminum* being there known as *Lecrah Suffed*. The Persian fruit is probably derived from *Carum gracile*, Lindl. (*Carum nigrum*, Royle), of which Mr. Holmes gives an illustration taken from a herbarium specimen in the Botanical Museum of Cambridge. The seed is also mentioned in Dymock's "Materia Medica of Western India" by the name of *Sajive* or *Siah-Zirah*. Among the few Umbelliferae of which the first has an odor of cumin, is also

**Psammogeton Setifolium**, Boiss; but its fruit differs clearly from both the Persian and the ordinary cumin, hence this species cannot be regarded as the parent plant of the seed in question. Sage has studied the anatomical characters of the fruit of both varieties of cumin, and publishes accurate illustrations, both of the entire fruit and of the transverse sections, which enable the drug to be clearly distinguished. Schimmel's Semi-Ann. Rep., April, 1913, 49-50; from Perfum. and Essent. Oil Record, 4 (1913), 43, 46 and 49.

#### RANUNCULACEAE.

**Aconite.** *Physiological Assay.*—George B. Roth observes that the variability of aconite preparations when tested physiologically has shown that the chemical method of assay which is required by the U. S. P., VIII, for *Aconitum napellus*, is not a measure of its activity. A preparation relatively rich in total alkaloids may have a low toxicity and vice versa. Other chemical methods than the official ones, which have been recommended have upon investigation been found to be equally unreliable. For this reason a search was made for a physiological test which might be used to determine the activity of aconite. After a brief review of the chemistry and pharmacology of aconite (by which is meant the official preparations of the root of *Aconitum napellus*), the author describes in detail his own experience with seven physiological methods that have been proposed, and tabulates the results obtained with certain specified preparations, by: (1) the lethal frog method; (2) by the Squibb method; and (3) by the lethal guinea-pig method. From this table the inadequacy of the lethal frog method is seen and a degree of parallelism is noticed between the Squibb method and the lethal guinea-pig method, the latter showing a higher ratio except in the case of aconitine.

Summarizing his work, the author concludes that, of the methods investigated, the Squibb and the lethal guinea-pig methods alone can be used with any degree of accuracy. The frog methods are



undoubtedly worthless. Theoretically, a blood pressure method would be equally worthless, since we know that aconite contains alkaloids which have antagonistic effects on the circulation. Practically the inefficiency of such a method has been demonstrated in this investigation. The perfusion method is seen to be much more delicate than any other for aconitine, but cannot be used with success with galenicals on account of the fact that they contain all three alkaloids which have dissimilar heart effects. The relative activity of aconitines, however, could be measured by the perfusion method, using a similar dilution of unlike preparations.

The author adds that many criticisms have been urged against the Squibb method, the subjective factor being regarded as detrimental. This he believes is an objection, since he found that his results were so much lower than those of other observers. However, if the individual is standardized against a good preparation, the test can be used, and he believes it is a measure of the activity of aconite, since the tingling is produced only by the aconitine and not by the other alkaloids in the drug. The guinea-pig method is the most delicate toxic method investigated and showed little or no variability.—Journ. A. Ph. A., June, 1913, 705-712.

**Aconitum Lycoctonum.** *Research on the Alkaloids.*—Schultze and Bierling report an exhaustive research on the alkaloids of this plant. After giving a résumé of prior work by Hübschmann, by Flückiger and by Dragendorff and his pupils and after noting that the latter clearly described two alkaloids, *lykaconitine* and *myoctionine*, the present writers noting some discrepancies and contradictions in these reports, undertook anew the study of these alkaloids and find:

1. That lykaconitine is  $C_{36}H_{46}N_2O_{10}$  and that by hydrolysis with alkali (+ 2  $H_2O$ ) it splits into lycoctonine,  $(C_{25}H_{39}NO_7)$ , and lycoctoninic acid,  $C_{11}H_{11}NO_5$ .

2. That lycoctoninic acid, on boiling with hydrochloric acid, hydrolyses (taking up 1 molecule of water) into anthranilic acid,  $C_6H_4(NH_2)COOH$  and succinic acid  $C_2H_4(COOH)_2$ .

3. That lykaconitine hydrolyzed with 10% hydrochloric acid splits into succinic acid and anthranoyllycoctonine, the latter hydrolyzing with alkali into lycoctonine and anthranilic acid.

4. Myoctionine has double the formula of lykaconitine— $(C_{36}H_{46}N_2O_{10})_2$  and like lykaconitine hydrolyzes to lycoctonine and lycoctoninic acid.

5. Lycoctonine contains 4 methoxyl groups, 1 methylimide group and 2 hydroxyl groups.

The authors bring out, in tabulated form, the similarity of the alkaloids from the different species of aconite, showing that all hydrolyze to certain organic acids and to definite bases each built upon the same skeleton of 21 carbon atoms to which in each case is attached 4 methoxyl groups.

In the investigation, the following bodies were isolated and studied:

**Lykaconitine** (up to 2.5%), yield from *A. lycoctonum* dextrogyrate, not yet obtained as crystals or in crystalline salts.

**Lycoctonine**, dextrogyrate, sinters at 120°; melts at 131°-133°; its hydrochloride, hydrobromide and perchlorate; its iodomethylate  $C_{26}H_{12}NO_2I$  (m. p. 178°) and the gold salt of its quaternary base,  $C_{25}H_{39}NO_7CH_3HAuCl_4$ .

**Lycoctoninic Acid** (m. p. 179°) *succinic acid*; *anthranilic acid* and *Anthranoyllycoctonine* and its perchlorate.

The paper closes with a tabulation of the reactions of the basic bodies with alkaloidal precipitants and with the well-known alkaloidal color tests.—Arch. d. Pharm., 251 (1913), No. 1, 8. (H. V. A.)

**Aconite.**—*Deterioration of Its Preparations.*—H. H. Sams says that he has determined by study and experiment that preparations of aconite readily deteriorate; that the tincture is the most stable of such preparations and he recommends storing it in small containers in a cool, dark place.—Proc. Texas Phar. Assn., 1913, 97-100. (E. C. M.)

**Delphinium Ajacis.**—*Characters of Alkaloids.*—Keller and Völker, desiring to continue the work of the former on the alkaloids of *Delphinium Consolida*, had 25 kilos of the seed worked up in the Merck factory. With much surprise it was found that the yield of alkaloid was very small and further investigation showed that the seed used was not *D. Consolida*, but that of *D. Ajacis*, an ornamental plant preferred by most florists to the regular (*Consolida*) larkspur.

Since the seed of *D. Ajacis* did contain alkaloids, but different from those of *D. Consolida* and requiring different extraction, these alkaloids were forthwith studied. The *Ajacis* seed were extracted with alcohol and the resulting extract was treated successively with ammonia-ether, ammonia-chloroform, potassa-ether and potassa-chloroform. The alkaline potassa fluids extracted the alkaloids in sufficient purity to crystallize and thus were obtained

two alkaloids: one, (m. p. 142°-143°) which was named Ajacin and another (m. p. 162°-163°) named Ajaconine.

**Ajacin** showed on combustion, the formula  $C_{15}H_{21}NO_4H_2O$  gave a molecular weight estimation of 319 (theory 297.2). The hydrochlorate is very soluble in water and crystallizes from alcoholic hydrochloric acid solution with 2 molecules of water of hydration (m. p. 93°). From it, the platinum and gold double salts were prepared and analyzed. The bromide could not be obtained in crystalline form.

Ajacin contains three methoxy groups, but the condition of the fourth atom of oxygen is not yet settled. The alkaloid was not methylated by action of methyl iodide; it oxidized with permanganate to a substance having an odor resembling butyric or valeric acid; distillation with zinc dust gave a liquid smelling like benzaldehyde, while Braun's reaction with bromecyanogen gave a compound melting at 132°-133°, and giving a white precipitate when treated with hot fuming nitric acid and silver nitrate. Because of present lack of material, further work could not be done.

**Ajaconine**, on combustion, gave discordant figures, preventing a satisfactory deduction of formula by that means. With the small amount of alkaloid so far obtained, well-crystallized salts have not yet been secured nor was the methoxyl reaction satisfactorily accomplished. The iodo-methylate (m. p. 121°) was prepared and its iodine assay points to the formula  $C_{16}H_{31}NO_2HI + H_2O$ . If this is so, the free alkaloid is  $C_{17}H_{29}NO_2$ , which agrees fairly well with the combustion figures. Treatment with nitrous acid gave a body showing the Liebermann's reaction indicating that the alkaloid is a secondary base. It formed a di-benzoyl compound, giving a crystalline gold compound  $C_{17}H_{27}NO_2(C_6H_5CO)_2HAuCl_4$ . -Arch. d. Pharm., 251 (1913), No. 3, 207. (H. V. A.)

**Hydrastis.** *Successful Culture Experiments in Russia.* The great demand for hydrastis and its consequent high price has prompted Ferrein, an apothecary of Moscow, Russia, to undertake culture experiments with plants derived from America, on the lines of the experience there gathered by the cultivators of the plant, selecting for this purpose an apple orchard on his estate, near Moscow, to secure the necessary shade. The climatic conditions of Central Russia are about the same as those prevailing in the regions where the American culture experiments have been successfully carried on, the principal difficulty presenting itself in the nature of the soil, which is usually clayey, hard, and deficient in

moisture. The beds were therefore prepared by removing the clayey layer to the depth of about  $1\frac{1}{2}$  meter, replacing it with earthy soil mulched with decayed leaves, and providing also the necessary moisture. As in the American culture experiments, the divided rhizomes from well developed plants were planted in these beds at such distances apart that four plants occupied the space of one square meter. The divided rhizomes planted during August 1909 developed splendidly, as did also additional supplies imported from America during 1910 and 1911, so that at the present time more than 21,000 well developed plants are on the plantation. Analyses of rhizomes grown in 1909 gave exceedingly favorable results, yielding 2.99 per cent. of hydrastine, whereas the original wild growing American rhizomes yielded on an average only 2.5 per cent. of alkaloid.—Apoth. Ztg., xxviii (1913), No. 60, 569–570; from Pharmazewtit-Scheskii Journ.

#### ANONACEAE.

**Cananga Odorata.**—“*Unona odorata*” not a Synonym.—In a foot-note to an article in which W. Holtz describes the cultivation and the botanical properties of the Ylang Ylang tree (*Cananga odorata*, Hook, fil. et Thoms), the author calls attention to the fact that *Unona odorata*, Dun., is not, as is occasionally asserted in literary references, a synonym for *Cananga odorata*, but is a different, though very closely allied species, of which the flowers can be put to the same economic use, and for that reason is cultivated in many places, for instance in Réunion, for the same purpose as *Cananga odorata*.—Schimmel's Semi-Ann. Rep., October, 1913, 36; from Der Pflanze, 9 (1913), Suppl. No. 1, 19.

#### MENISPERMACEAE.

**Pareira Brava.**—Review of the Alkaloidal Constituents.—Scholtze publishes a review of his work on the alkaloids of pareira brava and a critique of the recent work of Faltis (Journ. A. Ph. A., 1912). He maintains that the formula which he originally announced for bebeerine— $C_{18}H_{21}NO_3$ —is the correct one; that iso-bebeerine is the stereoisomeric  $C_{18}H_{21}NO_3$ ; that Faltis' formula for this,  $C_{21}H_{23}NO_4$ , is due to the fact that his product, crystallized from chloroform, contained chloroform of crystallization; that the  $\beta$ -bebeerine of Faltis is another isomer of bebeerine, its formula being  $C_{18}H_{21}NO_3$  and not, as Faltis says,  $C_{21}H_{23}NO_4$ ; that these three bodies have the formula  $C_{16}H_{14}O(OH)(OCH_3)NCH_3$ ; that true bebeerine is optically active and is known in its three (*d*-, *l*-, and *i*-) modifications; that dextrogyrate and levogyrate bebeerine and also  $\beta$ -



bebeerine can be acetylized to the same inactive triacetyloxy-bebeerine; that iso-bebeerine on the other hand acetylizes to two bodies: one, a dextrogyrate tri-acetyl combination, the other, an inactive variety, the comparative yield of the two being dependent on duration of heating with acetic acid anhydride; that the triacetyloxyisobebeerine bodies gave a deep reddish color with concentrated sulphuric acid, while the one from bebeerine and iso-bebeerine gives with the same reagent an orange-red tint.

Scholtze further points out that the different results obtained by Faltis and himself are likely due to the fact that Faltis worked with commercial bebeerine sulphate, which contains little or no true bebeerine and which consists chiefly of  $\beta$ -bebeerine. On the other hand, pareira root contains little or no  $\beta$ -bebeerine. This remarkable difference is a question of means of extraction and notably the temperature employed in extraction, Scholtze's experiments showing a tendency of *l*-bebeerine to change to  $\beta$ -bebeerine during evaporation to dryness.

During the investigation, the following substances were prepared and studied:

(1) Bebeerine methyl iodide,  $C_{18}H_{21}NO_3CH_3I$ , (2) Iso-bebeerine,  $C_{18}H_{21}NO_3$ , (3) Hydroiodide and hydrochloride of same, (4) iso-bebeerinemethyliodide,  $C_{18}H_{21}NO_3CH_3I$ , (5)  $\beta$ -bebeerine,  $C_{18}H_{21}NO_3$ , (6)  $\beta$ -Bebeerinemethyliodide,  $C_{18}H_{21}NO_3CH_3I$ , (7) two triacetyloxyisobebeerines,  $C_{16}H_{14}O(OCH_3)(OCOCH_3)_2N(CH_3)(COCH_3)$ , one melting irregularly between  $130^\circ$  to  $140^\circ$ , the other at  $291^\circ$ , (8) two monoacetyloxyisobebeerines, one melting at  $280^\circ$ , the other at  $330^\circ$ - $332^\circ$ , (9) triacetyloxybebeerine,  $C_{16}H_{14}O(OCH_3)(OCOCH_3)_2N(CH_3)(COCH_3)$ , melting at  $125^\circ$ - $135^\circ$  and made from both bebeerine and from iso-bebeerine, (10) benzyisobebeerine,  $C_{18}H_{20}(COC_6H_5)NO_3$ , melting at  $215^\circ$ .—Arch. d. Pharm., 251 (1913), No. 2, 136. (H. V. A.)

#### RUTACEAE.

**Angostura Bark.**—*Research on Alkaloidal Constituents.*—Troeger and Beck publish a long article supplementing the previous work of Troeger and his pupils, starting with a sample of crude cusparine obtained in previous work from an extract of angostura bark. From this, by fractional crystallization, was obtained pure cusparine (m. p.  $91^\circ$ - $93^\circ$  C.), galipoidin (yield only 0.3 Gm. from 460 Gm. crude alkaloid) and a new alkaloid melting at  $186^\circ$  C. (yield 0.4 Gm. from 460 Gm. crude alkaloid).

The galipoidin  $C_{19}H_{15}NO_4$  (m. p.  $233^\circ$ ) contains one methoxyl ( $OCH_3$ ) group.

The *new alkaloid* showed on combustion the formula  $C_{16}H_{13}NO_2$ , although because of scarcity of material, this datum can be considered only as tentative.

Seventeen combustions were made of the pure cusparine and the figures obtained indicate that the Kærner and Bœhringer formula  $C_{19}H_{17}NO_3$  is correct rather than the Beckurts and Nehring formula  $C_{20}H_{19}NO_3$ . This obtains for each of the three crystalline forms of the alkaloid (all melting at  $91^\circ-93^\circ$ ): the straw-colored, the ruby-red and the pure white crystals.

The following salts of cusparine were prepared for the first time and analyzed: the oxalate (m. p.  $140^\circ-150^\circ$ ); the succinate (m. p.  $113^\circ$ ); the malate (m. p.  $152^\circ$ ); the tartrate (m. p.  $161^\circ-162^\circ$ ) and the citrate (m. p.  $174^\circ$ ), each of which on fusion yield pyrocusparine. This pyrocusparine, obtained for example by heating the cusparine oxalate in a flask on paraffin bath to  $185^\circ$ , has the formula  $C_{18}H_{15}NO_3$  and represents the removal of methyl groups from cusparine, as shown by the fact that while the latter shows the methoxyl reaction, pyrocusparine does not. From pyrocusparine was prepared the hydrochlorate (m. p.  $207^\circ$ ) and the *platinum double salt*  $(C_{18}H_{15}NO_3)_2H_2PtCl_6$  melting around  $150^\circ C$ .

From cusparine the iodomethylate  $C_{17}H_{19}NO_3CH_3I$  (m. p.  $190^\circ$ ); the iodoethylate  $C_{17}H_{19}NO_3C_2H_5I$  (m. p.  $206^\circ-212^\circ$ ) and the iodo-*n*-propylate  $C_{17}H_{19}NO_3C_3H_7I$  (m. p.  $187^\circ$ ) were prepared and analyzed, confirming the  $C_{17}H_{19}NO_3$  formula of the alkaloid. Preparation of a chlorobenzylate was attempted without success.

Oxidation of cusparine with nitric acid (sp. gr. 1.075) by warming for a short time, gives a nitro-body  $C_{17}H_{14}N_2O_4H_2O$  melting at  $142^\circ-144^\circ$ ; while heating little cusparine with much nitric acid (sp. gr. 1.075) on water bath for 80 hours gives a white body, melting at  $269^\circ$  and showing on analysis the formula  $C_{10}H_9NO_4$ . Examination of this substance showed it to be an oxyquinolinic acid, since heating to  $140^\circ$  converts it into oxyquinoline, the identity of which was proven by preparation and analysis of the platinum salt.

These experiments lead the investigators to the conclusion that the structure of cusparine is  $(C_2H_3O)(OH)C_9H_4N \cdot CH_2C_6H_4OCH_3$ . The exact position of each of these side groups has not yet been determined. The breaking down of the cusparine molecule by the Hoffman method shows that the iodemethylate of cusparine treated with moist silver oxide or with potassium hydroxide yielded a body melting at  $194^\circ$  of which 14 combustions were made with

results that pointed to the formula  $C_{19}H_{17}NO_3$ . From it a platinum salt,  $(C_{19}H_{17}NO_3)_2H_2PtCl_6$ , and a nitro-body,  $C_{19}H_{16}N_2O_5$ , were prepared. The same body (m. p.  $94^\circ$ ) was obtained by treatment of the iodoethylate and the iodopropylate with moist silver oxide. —Arch. d. Pharm., 251 (1913), No. 4, 246. (H. V. A.)

**Buchu.**—*Culture Experiments in South Africa.*—From a valuable and interesting article on the history, cultivation, and commerce of buchu, published by G. R. von Wielligh in the July number of the "Agricultural Journal of the Union of South Africa," a lengthy summary of which appears in the "Chemist and Druggist," the following abstracts may profitably find place here. Mr. von Wielligh writes that "up to the present the culture of buchu has been sadly neglected in South Africa, where the plant is indigenous. Instead the reverse policy has been pursued, and these valuable plants have been injudiciously exterminated by the colored laborers. The mode pursued up to the present has been either to cut down the plants in the most careless way with sickles, or to uproot them, of which methods the latter is much more to be deprecated than the former." No steps were taken by the Government to prevent this extermination of the plant, and only feeble action by local authorities, but quite inadequate to prevent destruction. A few people, however, have taken up the growing of buchu, but chiefly as a curiosity, and not on commercial lines. The author then gives his own experience of the cultivation of the three species of *Barosma* which go to swell the buchu of commerce, his experiments dating as far back as 1875, when he obtained some plants of the mountain buchu (*Barosma betulina*), and planted them in a garden under his own supervision.

In 1903 the author made some experiments in cultivating the "kloof buchu" (*B. serratifolia*) in a plantation consisting of 1,300 young plants; but these were so badly injured by the colored employés in the process of planting and exposure of the roots, that no accurate data could be obtained as to the success or otherwise of the experiment, though in spite of all the bad treatment the plants received the greater number of them grew. The author draws his conclusion from these experiments that the kloof buchu possesses greater vitality than the mountain buchu (*B. betulina*), that it also grows more easily from cuttings, and that it prefers a black sandy loam to the red sandy loam in which *B. betulina* mostly thrives. But, he says, what is further essential is—(1) analyses of the different soils the buchu delights in, (2) analyses of the ashes of the

various species of buchu, and (3) analyses of the oil or aromatic properties of the leaves at various stages of growth.

In considering in detail the three species of *Barosma* known to furnish the buchu-leaves of commerce, Mr. von Wielligh arranges them in the following order: (1) *B. serratifolia*, which he calls the kloof buchu; (2) *B. betulina*, the mountain buchu; and (3) *B. crenulata*, the large-leaved buchu. In his description of the species, however, he points out that *B. betulina*, which is also known as the honey buchu, "is undoubtedly the most valuable, as it contains the greatest number of oil-glands in its smaller, light green tinted leaves." Its habit is more compact and dwarf-like than the other species, and, moreover, it is more abundant, which is an important point. *B. serratifolia* he classifies a second best, and *B. crenulata* as "not so widely distributed and not so well known."—Chem. and Drugg., Sept. 6, 1913, 403.

**Buchu.**—*A New Adulterant on the American Market.*—R. B. Harvey directs attention to a new adulterant of buchu, present to the amount of only 3 or 4%, however, the intense astringency and bitterness of which make it especially objectionable. As no flowers or other diagnostic features were found, the botanical source of the leaves has not been determined, but they are probably derived from some shrub growing in the same locality as buchu.

The leaves of the adulterant are somewhat darker in color than buchu and of a different shape. They are oblong, lanceolate, 10-20 Mm. long and 3 to 8 Mm. wide with acute apex and obtuse base. They are also much thicker than buchu, the average being about  $\frac{1}{2}$  Mm. The upper surface of the leaf is olive-green, glabrous, and finely reticulate; the under surface, somewhat lighter in color and minutely tomentose. The margin is entire and revolute, and the texture coriaceous. The paper is illustrated by microscopic cross sections of the adulterant and of genuine buchu, which exhibit marked differences. Journ. A. Ph. A., October, 1913, 1305-1306.

**Buchu.**—*New Adulterant.*—James Small gives a macroscopic and microscopic description of a new adulterant of buchu which has recently been imported into England. The new adulterant is very similar in color to *Barosma betulina*, and would thus easily escape detection on superficial examination. The two leaves are, however, distinguished by the macroscopic and microscopic characters revealed by the author's examination. The botanical source



of the false leaf has not yet been ascertained. Pharm. Journ. and Pharmacist, April 12, 1913, 511.

**Barosma Pegleræ.**—*A New South African Species.*—R. A. Dümmer describes a new species of *Barosma* which occurs on grassy slopes in the eastern parts of South Africa. The leaves show some resemblance to those of *Barosma lanceolata*, but they differ from these in their shape, which is broader and elliptical, and by the presence of oil cells on the lower surface of the leaf. It is not yet possible to judge whether the leaves possess any economic value.—Schimmel's Semi-Ann. Rep., April, 1913, 34; from Kew Bulletin, 1912, 326.

**Barosma Venusta.**—*Examination of the Leaves.*—Harold R. Jensen has subjected the leaves of the South African species of buchu, *Barosma venusta*, to an examination with a view to comparison with the buchu in present use. The powdered leaves were first exhausted in a Soxhlet apparatus, in separate portions, with absolute alcohol and ethyl acetate, and the following figures obtained: Soluble in alcohol, 23.5 per cent. (7.3 per cent. water soluble, 11.3 per cent. ether soluble). Soluble in ethyl acetate, 16.5 per cent. (9.1 per cent. water soluble, 12.8 per cent. ether soluble). The alcoholic extract possessed a marked blue fluorescence, which intensified considerably with alkalis, but no familiar oxymethylantraquinone derivatives could be detected by the polyphenol peroxide colorations. Further examination disclosed the presence of an appreciable amount of mucilage-yielding substances, a large amount of oleoresin with some acidic resins, together with colorless glucosides, fatty matter, carbohydrates or sugars, with only a little tannin. Alkaloids were entirely absent. On subjecting 20 lbs. of the leaves to steam distillation, 113 Cc. of the

**Volatile Oil of Barosma Venusta** (= 1.1% calculated on the air-dried drug) were obtained. This oil had a greenish yellow color and a strong peculiar odor, characteristic of the leaves; sp. gr., 0.8839; opt. rot.,  $+0^{\circ} 30'$ ; refr. index, 1.4967; acid val., 2.4; sapon. val., 13.4 (after acetyl., 52.8). It showed the following tentative composition, which will possibly be found not far from the truth:

Hydrocarbons (myrcene).....	35
Phenols (chavicol).....	16
Alcohols (myrcenol and from sesquiterpenes).....	15
Ethers, phenolic (methylehavigol, anethol).....	15
With sesquiterpenes, esters, ketones, aldehydes and acids up to .....	100

—Pharm. Journ. and Pharmacist, Jan., 1913, 60-61.

## ZYGOPHYLLACEAE.

**Guaiac Resins.** *Comparative Value as Reagents According to Source.*—Professor Ed. Schaer has made an interesting investigation regarding the sensitiveness of different varieties of guaiac resins as reagents. Four kinds of guaiac resin were employed in the investigation: Natural resin, selected pieces from the interior mass; natural resin, purified by alcohol; resin extracted from guaiac wood with alcohol; resin extracted from the wood with chloroform. With these resins solutions of different strengths were prepared with 90% alcohol, and both direct and indirect oxidation reactions carried out with them. The results lead Prof. Schaer to the conclusions: (1) That a good natural guaiac resin is preferable to guaiac resin purified with alcohol or extracted from the wood with alcohol. (2) That guaiac resin *extracted from the wood with chloroform* affords the most sensitive and stable reactions, and must be regarded as being the most suitable for analytical purposes. Furthermore, that favorable results claimed by recent writers with a tincture of the wood prepared with alcohol, in contrast with natural guaiac resin, must be referred to comparisons with results obtained by the use of inferior or, possibly, adulterated specimens of the latter. —Pharm. Ztg., lviii (1913), No. 33, 328; from Gehe & Co.'s Handelsbericht, 1913.

**Manduro.**—A *New Oil-Yielding Tree from Portuguese East Africa.*—T. A. Sprague states that leafy branches of a species of *Balanites*, received at Kew from Mr. R. C. F. Maugham, H.M. Consul at Lourenço Marques, have been identified as belonging to an undescribed species of *Balanites* agreeing with a specimen in the Kew herbarium. The tree grows in profusion in the Lourenço Marques district, and produces a fruit whose kernel is highly oleaginous, and yields not less than 60 per cent. of a fine oil, perfectly suitable for alimentary, lubricating, or manufacturing purposes. A full description of the species is given under the name *B. Maughamii*, which is known in the Madanda forest by the native name "Manduro." The fruit, however, is not likely to be of economic value for export, owing to the difficulty of removing the external sugary pulp and of extracting the kernel from the thick, fibrous shell in which it is enclosed. The oil is clear, yellow, and liquid, without marked taste or smell, and the constants are: Sp. gr., 0.916; sapon. val., 198.5; iodine val., 100.—Pharm. Journ. and Pharmacist, June 28, 1913, 905; from Kew Bulletin, No. 4, 1913, 131.

## MALVACEAE.

**Kapok Seed and Oil.** *Chemical Investigation.*—Matthes and Holtz have studied the seed of *Eriodendron anfractuosum* and the oil obtained therefrom. The plant which belongs to the *Malvaceae* grows in the West Indies, Mexico and in Africa where it is now being cultivated in the German colonies for the seed hairs which are utilized in the textile industry, like cotton. After a general description of the tree and its oils, the authors present a careful botanical study of the seed both macroscopically and microscopically, illustrating its anatomy with eleven figures.

The chemical examination of the seeds shows that they contain 7.63% of moisture, 25.6% of fixed oil, 3.34% of nitrogen (corresponding to 20.87% of protein) and 5.6% of ash. The ash was chiefly potassium phosphate, but it also contained calcium, magnesium, sodium, iron, aluminum, chlorides, sulphates and silicates. The oil is yellow, having a faint odor, becoming turbid below 20° C. but a clear fluid at 28° C. Chilled to 10° and then filtered, it left about half of the original quantity on the filter as a semi-fluid mass. Its taste is at first pleasant but there is soon a scratching sensation felt in the throat, so it is not well adapted for food purposes. It has a specific gravity of 0.9218 at 15°; refr. index, 1.463 at 40°; viscosity, 11.5; iodine number 88.7 to 94.5; sapon. number 182.3 to 196.3, and its Reichert-Meissl number and its Polenske number are very low (0.8 and 0.34, respectively). It responds to the Halphen test and to the Milliau modification of the Becchi test. Its behavior to the Tortelli-Ruggeri modification of Becchi's test is different from that shown by cotton-seed-oil. The behavior of the oil when submitted to Wilman's, Serger's and Kreiser's reactions and to the elaidin test are given in the paper. The composition of the oil was determined by study of the bromination and oxidation products. The oil treated with bromine gave a tetra-bromide and a di-bromide, while on oxidation with alkaline permanganate, the oil yielded dioxy-, tetroxy-, and hexoxystearic acids. From the results obtained, it was shown that the oil consists of the triglycerides of palmitic, oleic and linoleic acids, that of the fatty acids, 26 to 28% is solid (palmitic acid) while the balance are liquid acids, the proportion of these being approximately 40% linoleic acid and 60% oleic acid. The oil contains no stearic acid. About 4% of the oil is unsaponifiable and this consists of phytosterins, from which after many difficulties there was obtained a pure product melting at 136°

and having the specific rotation—29.97°.—Arch. d. Pharm., 251 (1913), No. 5, 376. (H. V. A.)

**Kapok and Akon.**—*Two Typical Seed Hairs Used in the Textile Industry.*—Matthes and Streicher have examined these two types of seed hair grown in Java and in the German African colonies which have some use in the textile industry. The authors find that these fibers differ from cotton in the fact that they are quite brittle and contain much ash. Cotton fibers consist of 95 to 96 per cent. of cellulose, no lignin, and 1 to 3 per cent. of pentosans while kapok contains 64.3 per cent. of cellulose, 13 per cent. of lignin, 23 per cent. of pentosans and 3.6 per cent. of ash. Akon resembles kapok in most particulars. The authors gave careful study to the non-fibrous matter contained in the crude seed hairs and found 7 to 8 per cent. of moisture, 5 to 10 per cent. of water-soluble material, about 3.5 per cent. of mineral salts, and about 0.6 per cent. of wax, consisting of phytosterins and melissyl alcohol, combined with palmitic, linolenic, linoleic and oleic acids. Both kapok and akon have a bitter taste and by extraction of the fibers with diluted alcohol, the bitter substance was obtained in the form of an extract, which was neither alkaloidal nor glucosidal, was free from nitrogen, gave some characteristic color reactions, and resembled picrotoxin. The extract was distinctly toxic, 0.005 Gm. killing a 50 Gm. frog in 20 minutes. Attempts to purify the substance by special crystallizations have not as yet been successful.—Arch. d. Pharm., 251 (1913), No. 6, 438. (H. V. A.)

#### STERCULIACEAE.

**Cacao.**—*Chemical Investigation of the Fresh Beans.*—L. Reutter has made a chemical investigation of fresh cacao beans and communicates some interesting observations. The fresh beans, sterilized with steam at 110° C. to kill enzymes, and deprived of fat, yielded to weak, methyl alcohol a reddish violet liquid, which, when allowed to evaporate spontaneously, deposited small rectangular white microcrystals with pointed extremities, soluble in water. These were purified by treatment with petroleum ether and were recrystallized from methyl alcohol. They melted at 184° to 185° C. The solution in boiling water was neutral, becoming brownish on exposure to air, and pink when acidified; it was optically inactive. This substance,

**Cacaorine** ( $C_{16}H_{20}N_3O_6$ ), when hydrolyzed, yielded theobromine and a reddish brown, insoluble, amorphous precipitate. The



reddish violet mother liquor after the separation of the crystals of cacaorine was evaporated *in vacuo*, when it separated in reddish violet scales. This substance was named *cacao-red*. When powdered, it formed a blood-red odorless powder, which slowly oxidized in the air, turning brownish. Soluble in water, the solutions were colored yellowish brown by alkalies, and bright red by acids. With picric acid they give a blood-red color; with copper acetate, green; with ammoniacal zinc acetate, violet, with a grayish precipitate; with ferric chloride a brownish red, with a slight brown precipitate. Optically inactive, the solutions of cacao-red reduced Fehling's reagent and permanganate, and precipitated with gelatin, mucilage of acacia, copper acetate, ferrous sulphate, basic and neutral lead acetate, and potassium bichromate. When hydrolyzed by boiling with dilute sulphuric acid, carbonic acid gas was generated, and a brown precipitate formed, also a dextro-rotatory sugar. Cacao-red has the formula  $C_{40}H_{60}NO_{27}$  and its brown hydrolysis product that of  $C_{76}H_{78}NO_{34}$ . The latter is named *cacao-brown*.—Pharm. Journ. and Pharmacist, July 26, 1913, 113; from Compt. rend., 156 (1913), 1842.

**Cacao Beans.**—*Suggested Improvements in the Preparation.*—E. Perrot observes that the present method of preparing cocoa for commerce is very crude, and causes deterioration of the quality of the final product, which, moreover, is not uniform in character. In order to render the seeds more easily separable from the pulp, the latter is now allowed to undergo a process of alcoholic fermentation. This in itself is detrimental to the quality of the cocoa. At the same time certain changes take place in the seed itself, due to diastasic action, which further reduces its value. The author suggests that the fruit should be treated with very dilute alkali, which renders the pulp easily separable from the seeds. The latter should then be removed by mechanical means, and at once sterilized by steam. This would arrest diastasic action. After drying, the seeds obtained would be unalterable and of a definite character. Results obtained by the practical use of these simple methods have been most encouraging; the cacao beans thus produced have been of excellent quality and have undergone no change on keeping.—Pharm. Journ. and Pharmacist, June 7, 1913, 801; from Compt. rend., 156 (1913), 1395.

**Cacao and Chocolate.** *Presence of Copper.*—C. Formenti observes that very varying figures have been published by previous workers for the amount of copper to be found in cacao beans and

the products made from them, and the quantities most usually quoted in books on foods, etc., are the highest which have been recorded. These were published by Gautier in 1883, and include figures up to 40 Mgm. of Cu per kilo for cacao, 225 Mgm. per kilo for the husks, and 125 Mgm. per kilo for chocolate. In view of these very high figures and the discrepancies between the results of different investigators, the author has undertaken further examinations of cacao beans and of different chocolates. The method employed was that given by Gautier for determining the amount of copper in vegetables, with the exception that in the cases of the shelled beans and of chocolate the material was gently charred before adding the sulphuric and nitric acids to avoid the frothing, which is otherwise troublesome; the copper was finally separated electrolytically and weighed in the pure state. Three varieties of cacao, respectively, Bahia, Caracas, and Guayaquil, were examined; the shelled beans were found to contain from 20 to 34 Mgm. of Cu per kilo, and the husks from 14 to 40 Mgm. per kilo. Thirty-seven different (Continental) makes of chocolate were tested, and the amounts of Cu found varied from 4 to 25 Mgm. per kilo, the average being 12 Mgm. It appears, therefore, that the higher figures frequently given are not representative. Pharm. Journ. and Pharmacist, May 24, 1913, 735; from Ztschr. f. Unters. d. Nahr. u. Genussm., February 1, 1913, 149.

## TILIACEAE.

**Freesia Leichtlimona.** *Poisonous Constituent.*—According to R. Rubois, the fragrant flowers of *Freesia leichtlimona* impart an agreeable perfume to wine in which they are macerated. But they contain a poison. A small dose of an alcoholic extract of the flowers given by injection will rapidly kill frogs or guinea pigs. On dogs the action is diuretic and salivating, and finally mortal. The alcoholic extract of the bulbs is not so active, but it is still poisonous. When crushed the bulbs liberate a peculiar odor, probably due to interaction of some constituents. The chemical nature of this poison is worthy of investigation. Pharm. Journ. and Pharmacist, May 3, 1913, 629; from Répertoire, 25 (1913), 170.

## GUTTIFERAE.

**Ochrocarpus Siamensis.** *Peculiar Perfume Constituent of the Flowers.*—David Hooper observes that the flowers of *Ochrocarpus Siamensis*, T. Anders., a tree called "Tharapu" in Burmah, were recently received at the Indian Museum, Calcutta, from Mandalay. They are interesting in that they yield a perfume resembling

violets. The odorous principle may be extracted by means of oils or fats. A supply of the seeds of the plant was also received from Mandalay, and they were tested with the object of discovering whether they are oleaginous, as other seeds of the Order Guttiferae. Dr. Dymock, speaking of *O. longifolius*, says: "The seed exudes a viscid gummy fluid when cut." The seeds of "Tharapu" yielded no fixed oil, but when extracted with ether afforded 7 per cent. of a fragrant, soft, yellow, acid resin. The occurrence of a resin in place of oil in the seeds of a Guttiferae is peculiar. Pharm. Journ. and Pharmacist, September 6, 1913, 369.

## VITACEAE.

**Chlorine-Poor Wine.** *Product from Chlorine-Rich Soils.*—Baragiola and Schuppli present analyses of wines made from grapes growing near the sea coast showing that they do not contain more chlorides than do those made from grapes grown in soils containing but little sodium chloride. Schweiz. Wschr. f. Chem. u. Pharm., 51 (1913), No. 13, 177. (H. V. A.)

## HIPPOCRATIACEAE.

**Gurjun Balsam.**—*Description of Burmese Specimens from Authentic Source.*—Schimmel & Co. observe that of the botanical origin of gurjun balsam it is known that the drug is derived from several species of *Dipterocarpus*, but that up to the present nothing has become known of the balsams produced by the different species; hence we are in complete ignorance whether, and in what respect, they differ from each other. Through the courtesy of Mr. C. C. Rogers, Conservator of Forests of Rangoon, Burmah, they have now procured two balsams of authentic botanical origin, of which they give the following particulars:

**Dipterocarpus Turbinatus**, Gaertn. fil., is a large tree which is found throughout tropical Burmah, in Bengal, and on the Andaman Islands. Its balsam is specially known there as "*gurjun oil*." It is collected in large quantities and is used as a paint for houses and ships, as well as a preservative for articles of bamboo. The sample received consists of a faintly acid, milky liquid; acid val., 10.9; sp. gr., 0.9811. When allowed to stand, especially in the warmth, it separates into a brown oil and a viscous, whitish gray, emulsion-like mass. The constants of the oily layer were: Sp. gr., 0.9706; opt. rot.,  $10^{\circ}8'$ ; refr. index, 1.51200; acid val., 7.3; ester val., 1.9. By steam distillation, the total balsam yielded 46% of a pale yellow oil of a balsamic odor; Sp. gr., 0.9271; opt.

rot.,— $37^{\circ}$ ; refr. index, 1.50070; acid val., 0; ester val., 1.9; soluble in 7 vols. and more of 95% alcohol.

**Dipterocarpus Tuberculatus**, Roxb., yields a balsam of very similar appearance. It is known in Burmah as "*in oil*," and plays a very subordinate part compared with "*gurjan oil*." This balsam is of a pale brown color; its consistency is that of turpentine and its sp. gr. is 1.029; acid val., 17.8; ester val., 0. The oil obtained by steam distillation in a yield of 33% was of a yellow-brown color, and dissolved in 6 vols. and more of 95% alcohol; sp. gr., 0.9001; opt. rot.,— $99^{\circ}40'$ ; refr. index, 1.50070. With Turner's color reaction (solution of 3 or 4 drops of the balsam in 3 Cc. of glacial acetic acid, adding 1 drop of freshly prepared 10% sodium nitrite solution, and layering the mixture very carefully on 2 Cc. of concentrated  $H_2SO_4$ ), both balsams gave the characteristic violet color of the test. Another balsam, which is derived from

**Melanorrhœa Usitata**, Wall (N. O. *Anacardiaceæ*), is greatly esteemed in Burmah, where it is known as "*thitsi oil*." The specimen received consisted of a thick, viscous, brown mass, turning black on exposure to air. It had an odor of train oil, but contains no volatile oil whatever. —Schimmel's Semi-Ann. Rep., April, 1913, 67-68.

#### ERYTHROXYLACEÆ.

**Coca.**—*The Mombreros (Coca Users) of Colombia.*—At the Nashville Meeting of the Association, Prof. John Uri Lloyd, introducing his subject by a reproduction of his interesting historical account of "*Coca The Divine Plant of the Incas*," published in 1910 (see Proceedings, 1911, 230), communicates a notable account from personal observations by his son, Mr. John Thomas Lloyd, describing the method of using the drug by the

"**Mombreros (Coca Users) of Colombia.**"—Associated with Mr. A. A. Allen, from the Department of Zoölogy of Cornell University. Mr. Lloyd and his companion visited regions of Colombia that are almost unknown to the scientific world, and made observations of the Indians' method of using the drug which he now records in this publication. It must suffice here to state that highly interesting observations were made on this journey, which, as shown by a map accompanying the paper enabled them to explore Colombia from Colon to Santa Maria, South America. These are considered under the following headings: The People; Coca and Coca Users; Coca Market; Method of Using Coca; Distribution of the Coca



Shrub; Coca Considered Indispensable to Indian Pack Carriers; The Paramo; Coca Users; Coca Not Used in the Eastern Low Lands; and close with the following

## SUMMARY.

"Coca-using Indians of Colombia do not *chew* the leaf, but suck the saliva-made juice from the huge boluses of coca leaves mixed with lime, stored in the cheek. So far as known, this has been the method of these people from the traditional past. These coca users are typical specimens of perfect physical manhood, being muscular and well formed. *Whether this is due to the coca, or is in spite of the coca*, is a question they did not solve. Their food is simple and sparing, consisting of corn, a little sugar, no fruits, no nuts, no fish, little meat, and occasionally beans or rice. Their endurance to both the fatigue of travel and exposure to the elements is phenomenal. From early daylight to the dusk of night they run or walk rapidly. Then, after supper (their first meal since morning), they sleep in a rude "shack" with no other cover than their capes to protect them from the penetrating cold of the damp air and wet ground. The disposition of these Indians is exceptionally pleasant, they being ever genial and good natured. "Not one sour, disagreeable, mentally unbalanced or wicked coca-using man or woman did we meet."

The paper is illustrated by numerous photographs, which not only serve to explain the text, but are of marked ethnographical value.—Journ. A. Ph. A., October, 1913, 1242–1253.

## SAPINDACEAE.

**Cashew Nuts.**—*Increased Use as a Substitute for Sweet Almonds.*—Cashew nuts, the decorticated seeds of *Anacardium occidentale*, are according to W. Hoepfner and H. Burmeister in increased demand as a substitute for sweet almonds in various confections, particularly in the preparation of the so-called "marchpane" (marzipan). The shell containing the poisonous "cardol" must be carefully removed before the nuts are used, and they are therefore supplied in a dried and decorticated condition. They consist of an embryo with large cotyledons, have an odor and taste reminding of sweet almonds, and are composed, according to Theopold, of 47.15% fixed oil, 0.40% ether extract, 7.20% alcohol extract, 9.70% reducing substances, 8.90% starch, and 3.80% of moisture. Dry, sweet almonds, on the other hand, contain, according to König, 21.40% of nitrogenous substance, 53.16% of fat, and 13.22% of non-nitrogenous substance, but contain no starch, and lose

6.27% on complete drying. The fixed oil of the cashew (or anacardiac) nuts was found by the authors to have the following constants: Hübl iodine number, 84; sapon. number, 195; acid number=5.3 Cc. normal soda solution; refract. index, 20°, 1.4702; refraction at 25°, 62. The authors recommend Bellier's reaction for the rapid differentiation of this oil from almond oil and ground-nut oil, which consists in shaking the oil with an equal part of nitric acid (sp. gr. 1.4) and of a saturated solution of resorcinol in benzol. In the case of cashew-nut oil a deep blue color is immediately developed; with ground-nut oil an immediate dark violet is formed; but with almond oil the development of color is very slow, and does not manifest itself until after prolonged shaking.—Pharm. Ztg., lviii (1913), No. 49, 484.

**Nephelium Longana.** *Possible Economic Use of the Seeds.*—Quoting from a recent Annual Report of the Indian Museum, Calcutta, David Hooper says that the fruit of *Nephelium longana*, Camb., known as "Longan" or "Ashphal," resembles the Litchi, and appears (in India) in the hot weather. The fresh fruit affords 13 parts of skin, 60 parts of pulp, and 27 parts of seeds in 100 parts. The seeds are sweetish, slightly astringent, and contain much starch. Chemical analysis shows them to contain: Water, 10.0; oil, 3.86; albuminoids, 6.25; carbohydrates, 73.76; fiber, 3.6; and ash, 2.5. They are not oil seeds, but the composition shows them to have a feeding value equal to that of some cattle foods.—Pharm. Journ. and Pharmacist, September 6, 1913, 369.

#### PAPAVERACEAE.

**Papaver Nudicaule.** *Hydrocyanic Acid a Constituent of the Leaves.*—Mirande says that in the Alpine garden at Lautaret, belonging to the University of Grenoble, *Papaver nudicaule* has hybridized freely with *P. alpinum*, giving a self-sown crop of hybrids, which afford an attractive show of red, yellow, and white flowers in various shades. The author finds that the leaves of these plants, when crushed and distilled, yield hydrocyanic acid, but in extremely variable amounts, ranging from 0.01 to 0.007 per cent. of the fresh material. In a series of experiments with plants bearing blooms of different colors it was found that those with yellow flowers, and which approached most closely to the typical *P. nudicaule*, invariably gave markedly more prussic acid than those others which more closely resembled the type of *P. alpinum*. On obtaining some true *P. alpinum* these were found to yield no hydrocyanic acid. The author has not yet succeeded

in growing sufficient material of the true *P. nudicaule*, but there is little doubt that it will be found to be the cyanogenetic factor in the case of the hybrids experimented with, since the more nearly the morphological characters of the plants approach *P. nudicaule*, so the amount of prussic acid yielded rises. This is accompanied in the tissues by a sufficiency of a specific enzyme, since the quantity is not increased by adding emulsin. — Pharm. Journ. and Pharmacist, November 22, 773; from Compt. rend., 157 (1913), 727.

**Russian Poppy Seed.**—*Contamination with Henbane Seeds.*—A contamination of poppy seed with hyoscyamus seeds was observed several years ago by V. Degen (see Proceedings, 1911, 235), chiefly in Russian poppy seed. C. Griebel and C. Jacobsen have now examined 36 samples of Russian poppy seed, but found only two samples to be contaminated with the poisonous seeds, one containing 0.32%, the other 0.26%. The remaining 34 samples contained no hyoscyamus seeds and were free from other contaminants with the exception of isolated caryophyllaceous seeds in many of them. Pharm. Ztg., lviii (1913), No. 42, 416; from Ztschr. f. Unters. d. Nahr. u. Genussm., 1913, No. 9.

**Poppy Seed.** *Method of Detecting and Separating Hyoscyamus Seed.*—The occurrence of hyoscyamus seed in Russian poppy seed has led to a ministerial decree declaring the presence of more than 0.05 per cent. of the poisonous seeds as dangerous to health. Dr. R. Woy has therefore endeavored to devise a reliable method for the removal of hyoscyamus seeds from the poppy seed or to reduce the quantity to within permissible limits. He finds the average weight of a hyoscyamus seed to be 0.65 Mgm., so that about 77 seeds would be contained in 100.0 Gm. of poppy seed containing 0.05 per cent. The hyoscyamus seeds being larger than poppy seeds, they are completely removed by sifting through a number 21 sieve, through which all the poppy seed will pass with the possible exception of about 5 or 6 per cent., which remains on the sieve with the hyoscyamus seed. This loss can be reduced, however, to within 1 or 2 per cent., by using a number 20 sieve, not more than an allowable percentage of hyoscyamus seed passing through the sieve under these conditions—this amounting to about 40 seeds from 100.0 Gm. of the contaminated poppy seed. Pharm. Ztg., lviii (1913), No. 92, 922; from Ztschr. f. öffent. Chem., 1913, No. 49.

**Opium.** *Suggestion of a "Normal Opium" and its Standardization.* In a paper presented at the British Pharmaceutical Con-

ference, 1913, P. van der Wielen points out that while the chemical standardization of some drugs is based on the determination of one of the active principles, in others it is based on the active principles taken together, and methods are cited in which the one or the other method prevails. Good reasons have been advanced why the standardization should not be based upon a single active constituent but, if possible, on the total, or at least the more important ones; and this applies particularly to opium, which is usually valued on the basis of its morphine content. The opposition to this method of the valuation of opium, it may be noted, is not restricted to the present day, but was voiced, for example, by Andrew Ure in his "Observations on Opium and its Tests," published in 1830. In consideration of these and other observations mentioned by him, Mr. van der Wielen suggests a

**"Normal Opium,"** based on four active principles: namely, morphine, narcotine, codeine, and meconic acid. The three alkaloids having been determined by known methods, the meconic acid is determined (and the standardization completed), by the following modification of a colorimetric method originally suggested by Dr. Ure:

Macerate 1 Gm. of opium with 100 Cc. of water for twenty-four hours, shaking the mixture frequently. Then filter and mix 25 Cc. of the opium solution with 5 Cc. of Goulard's extract. Allow to stand fifteen minutes or more, and transfer the precipitate to a small filter and wash with water until the washings are colorless. Dissolve the precipitate in warm decinormal hydrochloric acid until the volume is exactly 100 Cc. This yellowish solution contains the meconic acid of 250 Mgm. of opium in 100 Cc.

Next, in a 250 Cc. measuring flask, dissolve 50 Mgm. of pure meconic acid in decinormal hydrochloric acid, adding sufficient of a one-tenth per cent. solution of orange G. (about two Cc.) to give it, after filling to the 250 Cc. mark, the same color as the solution of the meconic acid of the opium. Put 5 Cc. of each of the two solutions in a little glass vessel with parallel sides a centimetre apart, and divided into two parts. (This was shown, each division holding about 10 Cc.) To each of the solutions add one drop of the test-solution of ferric chloride. Then add to the darker of the two solutions water from a burette until the same color is obtained in each division.

The examination of four samples of opium gave the following results:



	A.	B.	C.	D.
Morphine.....	12.2	14.1	10.5	12.4
Narcotine.....	5.8	4.8	6.8	7.6
Codeine.....	1.1	0.7	1.5	0.9
Meconic acid.....	5.4	4.3	4.5	6.4

The data are not sufficient to fix an average of the quantity of alkaloids that a "normal" opium should contain. But supposing that as the average of the analyses of a hundred samples of opium collected in different years and of different origin a proportion of 12 per cent. of morphine, 6 per cent. of narcotine, 1 per cent. of codeine, and 5 per cent. of meconic acid be found, then it is possible to make from each four samples of opium with higher and lower figures than the average a normal opium that contains the desired quantity of each principle. By mixing 274 Gm. of opium A with 268 Gm. of opium B, 216 Gm. of opium C, and 242 Gm. of opium D, there is produced one kilogram of "normal" opium. For practical purposes the use is allowed of opium containing morphine varying between 11.5 and 12.5 per cent., narcotine between 5.7 and 6.3 per cent., codeine between 0.9 and 1.1 per cent., and meconic acid between 4.7 and 5.3 per cent. If the quantity of morphine only in the above-mentioned opiums be taken into account, and the opium be diluted with sugar of milk or starch until the opium powder of the International Conference of 1902 is obtained, there are produced four opiums each with 10 per cent. morphine, but containing percentages of other alkaloids as follows:

	Narcotine.	Codeine.	Meconic Acid.
A.....	4.8	0.9	4.4
B.....	3.4	0.5	3.2
C.....	6.5	1.4	4.4
D.....	6.1	0.7	5.2

—Trans. Brit. Pharm. Conf. (Yearbook of Pharm.), 1913, 443-449.

**Opium.**—*Total Adulteration.*—W. Dulière reports an examination of a drug derived from Smyrna, which in its external characters resembled ordinary opium very closely, but even upon the most superficial examination raised a doubt of its genuineness. It showed marked differences in the loaves among themselves, some having a solid consistence with a brown-black interior, and having a faint agreeable odor reminding of opoponax, while others had a softer consistence, exhibiting internally a grey-white color and having an insipid odor. Subjected to a careful chemical and microscopic examination, none of these loaves contained either morphine or

other alkaloids.—Pharm. Ztg., lviii (1913), 33, 329; from Journ. de Pharm. d'Anvers, 1913, No. 5.

**Powdered Opium.**—*Adjustment to Specified Morphine Content.*—The G. P. requirement of exactly 10 per cent. of morphine in powdered opium is according to Heinrich Frerichs and Max Decker difficult to maintain, because the dried powder absorbs moisture on keeping and the morphine percentage is thereby correspondingly reduced. The authors therefore recommend the following method of adjustment which obviates this source of error: The opium is dried at 60° and powdered. After then determining the morphine content by assay in a weighed quantity of the dry powder this is spread out and exposed to the air until it has increased about 5 per cent. in weight, and thereupon adjusted to exactly 10 per cent. by the addition of the necessary quantity of starch. The product so obtained represents air-dry powdered opium of correct morphine percentage, which in the experience of the authors remains fairly constant. The authors also describe and recommend certain modifications of the official process of assay, which must be consulted in the original. Finally, the authors consider the official requirement of exactly 10 per cent. of morphine too stringent. The G. P. should either demand that this positive restriction apply to powdered opium dried at 60°, or the morphine percentage should be permitted to range between 9.8 and 10.1 per cent.—Apoth. Ztg., xxviii (1913), No. 70, 684–685.

**Opium.**—*Amount Consumed.* Three years ago the number of drug addicts in this country were estimated at more than one million; that 400,000 pounds of opium are imported into the United States and consumed yearly, and 150,000 ounces of cocaine illegitimately used; that drugged “soothing syrups,” medicated “soft drinks” and habit-forming “treatments” galore still spell prosperity for their exploiters; and that almost daily are seen such reports as “cocaine used by sons of prominent families,” “Boys use heroin,” “heroin cough-tablets bought daily at confectionery store by school-girls of 11 and 13;” or yet again, “physicians sell cocaine to drug-fiends,” “doctor sells cocaine to boys.”—J. Am. M. Assoc., v. 60, 1887–1888. (M. I. W.)

**Sanguinaria.**—*Proper Time for Collection.*—V. O. Homerburg and G. M. Beringer, Jr., state that their assays of this drug show that the time directed by the U. S. P. for its collection—after the death of the foliage—is the worst that could be selected; that the

rhizome and root are richest in alkaloidal content about or immediately after flowering, being at that time more than fifty per cent. greater than just before the death of the foliage. —Proc. N. J. Phar. Assn., 1913, 72-73. (E. C. M.)

## CRUCIFERAE.

**Mustard Meal.**—*Volatile Oil from Samples in French Commerce.*—P. Carles has determined the amount of volatile oil obtainable from mustard meals commonly offered on the French market and finds it to vary from 0.06 to 1.25 per cent. The lowest values (0.06 to 0.07 p. c.), were found in Russian and in "white" mustard meal, and the author believes that these sorts are frequently employed for the dilution of mustard meals yielding the higher percentages, particularly since the "Codex" requires a minimum of 0.7 per cent. of allyl-mustard oil. In order to rapidly estimate the value of a commercial sample of the meal, he recommends a physical test: 10.0 Gm. of the sample being triturated with 50.0 Cc. of water, and its characteristic odor, developed after standing 10 minutes, compared with that of a standard sample. A test depending on the taste, on the other hand, is not serviceable. Mustard meals, deprived of fixed oil by expression or by extraction with carbon disulphide or petroleum benzin, losing from 25 to 30 per cent. in weight, should show correspondingly higher percentages of volatile oil. This expectation was, however, not realized by the author's examinations, the percentages of allyl-mustard oil fluctuating between 0.3 and 1.45 per cent. —Pharm. Ztg., lviii (1913), No. 49, 484; from Rép. d. Pharm., 1913, No. 6.

## BIXINEAE.

**Chaulmoogra Seed Oils.**—*Enumeration of the True and the False.*—Professor Heinrich Pabisch, in a report to the Convention of Naturalists and Physicians, held at Vienna during September, 1913, stated that for a long period the fatty oils from the seeds of *Taraktogenos*, *Gynocardia*, and *Hydnocarpus* have been used by the natives of India under the name of chaulmoogra for the treatment of skin diseases, especially leprosy. The origin of real chaulmoogra oil has long been a subject of scientific discussion. *Gynocardia odorata*, R.Br., was originally considered the source of chaulmoogra oil. Desprez first drew attention to the fact that the seed brought into the bazaars of Calcutta and Bombay are derived from *Taraktogenes kurzii*, King (syn. *Hydnocarpus kurzii*, Warbg.), indigenous to Burmah. The largest quantities of chaulmoogra come from Burmah, and are brought into the market

via Chittagong to Calcutta and Bombay. The principal adulterants are seeds from *Gynocardia odorata*, R.Br., *Hydnocarpus anthelmintica*, Pierre, *H. Wightiana*, Blume, and *H. venenata*, Gärtn. Taraktogenos chaulmoogra oil is, when fresh, light yellow in color, odorless, and almost tasteless. On keeping it becomes more brownish. It melts at  $22^{\circ}$  to  $23^{\circ}$ , and has a specific gravity of 0.951 to 0.952. False chaulmoogra oil (ol. gynocardiæ) is at ordinary temperature of ointment-like consistency, and of a white to light yellow color. On being kept for some time it becomes greenish yellow, and changes in odor and taste. It melts at  $22^{\circ}$  to  $23^{\circ}$ , and has a specific gravity of 0.952. This should not be confounded with the similar krebao butter yielded by the seeds of *Hydnocarpus anthelmintica*, Pierre. During the last few years the oil of *Hydnocarpus venenata*, Gärtn., under the name of Maratti fat (cardamom oil), has been imported into Germany from India. Its use in the manufacture of margarine resulted in many poisoning cases.—Chem. and Drugg., October 25, 1913, 619.

#### CISTACEAE.

**Ladanum.**—*Source, Variation and Properties.*—The agreeably odorous resin known as "Ladanum," though well known and highly valued as a drug by the ancients, is modernly rarely mentioned in our literature, but has during the past year been rescued from oblivion by several articles which have appeared in the Journals (see Year Book, 1912, 209). The drug is the product of

**Cistus Ladaniferus**, a shrub indigenous particularly to Crete and Cyprus, exuding from the plant during the months of June to August in the form of viscous droplets, which, owing to their stickiness, adhere to the beards of goats browsing upon the herbage and are usually collected by their herders by combing. Naturally, the ladanum so collected (*Ladanum e barba*) is quite dirty, and the drug is distinguished by various degrees of purity (or impurity) depending on the method of its collection, the best sorts being accredited to Cyprus. Modernly, however, the various sorts are supplied in a condition of purity, due to a system of cleaning to which the drug is subjected, which consists in treating the crude ladanum with boiling water in which the resin is completely insoluble, the purified ladanum remaining on the surface while the dirt settles to the bottom. Ladanum consists of a dark brown resinous mass, of tough consistency, but readily kneaded and softened with the fingers. It is completely soluble in alcohol, its peculiar ambra-like odor being most pronounced in the form of



solution and due to a content of from 0.9 to 2% of an oil. Pharm. Ztg., lviii (1913), No. 13, 129; from Der Seifenfabr., 1913, No. 6.

## PASSIFLORACEAE.

**Carica Papaya, L.**—*Examination of the Seeds.*—David Hooper, quoting from a recent Annual Report of the Indian Museum, Calcutta, says that the seeds of the ripe fruit of the Papaya, which are usually thrown away as useless, were submitted to analysis. The seeds are small, rounded, and black; they have a pungent mustard-like odor, and yield an allyl compound when distilled with water. They contain in a dry state over a quarter of their weight of a yellow fixed fluid. The centesimal composition is: Water, 8.2; oil, 26.3; albuminoids, 24.3; carbohydrates, 15.5; fiber, 17.0; ash, 8.8.—Pharm. Journ. and Pharmacist, September 6, 1913, 369.

**Carica Papaya.**—*Cultivation in Queensland.*—Referring to the preceding article on the papaya, R. C. Cowley states that the pawpaw is cultivated extensively in Queensland, where several varieties are grown. It is to be found in almost every garden round about Brisbane, but does not reach the height mentioned in the article referred to, nor is Mr. Cowley able to endorse what is said about the flavor of the fruit, which is peculiar, and the taste for it is an acquired one. The seeds germinate rapidly if sown immediately after they are removed from the fruit, and if planted early in the spring bear fruit the first year. The variety usually grown is dioecious, and as it is impossible to predict the nature of the plant before it begins to flower one may have to uproot a crowd of males. The Cowley variety—not named after the author—is monoecious. It is of New Guinea origin, and its cultivation is increasingly popular. The fruit for marketing is collected before it is quite ripe, otherwise it will not carry; hence its flavor suffers considerably. In the unripe state the fruit—which varies much in size—is rich in milky juice; this disappears as the fruit ripens. Papain is not prepared in Queensland.—Pharm. Journ. and Pharmacist, December 27, 1913, 948.

**Carica Papaya.**—*Production and Uses of Papain in Ceylon.*—An unnamed writer has contributed an interesting article on the production and uses of papain in the far East. He says the fruit of the papaya tree has always been a favored breakfast dish with travellers in the East, the Pacific Isles, and tropical regions generally as much for its digestive qualities as for its lusciousness. Among

Oriental, particularly in South India and Ceylon, the digestive qualities of the papaya are so well known that the fruit is almost universally used, and, undoubtedly, with great effect in preventing dyspepsia. The *Carica papaya* grows largely in Ceylon, India, the East and West Indies, and the Hawaiian Islands, and seems to prefer a slightly sandy soil that is not too rich. The tree attains a height of twenty to thirty feet, and its broad leaves, with the fruit clustering beneath, form in a tuft at the top of the tree. The flavor of the fruit in the best papayas resembles that of a sweet, but rather insipid, melon mixed with violet perfume. According to the American Consul at Colombo, there are several varieties of *Carica papaya*, and the papain derived from the different kinds varies accordingly, the best being obtained from the male trees of the Ceylon hybrid papaya. The papain obtained from the West Indian variety is said to be inferior.

**Commercial Papain** is prepared in granular and powdered form. The natural color of the former is a light brown, which becomes darker when exposed to the air for any length of time. Powdered papain is of a light biscuit color, which does not change on exposure to air; a darker-colored powdered papain indicates adulteration or improper preparation. Dr. H. Huybertsz, the Ceylon authority, states that European and American importers object to papain in its natural color, and insist that it be white, or, at least, light. This, he says, is a great mistake, as it can only be obtained by bleaching, a process which sacrifices therapeutic efficacy for pharmaceutical appearance. The taste of papain is slightly saltish and somewhat acrid. It has a peculiar, unmistakable smell, and the "feel" of granular papain should be crisp like biscuit, and easily crushed between the fingers. When it is doughy or sticky, it has been adulterated and badly prepared. It has also slight escharotic action, and collectors of the fresh juice have the skin of their fingers blistered. When mixed with water it has a soapy feel.

At present a crude material is prepared by natives in Ceylon, and, containing abundant adulteration, is purchased cheaply by local firms, who export it as papain or papaya juice. Its preparation is primitive, and consists only of drying in the sun or over a smoky fire, and of thickening by the addition of starchy matter, such as bread, flour, arrowroot, biscuits, etc. Recently natives have resorted to the use of a dangerous material for use in adulteration, namely, the milk from the gutta percha and wild cactus. The latter has irritant properties, acting as a caustic. The comparative failure of papain as a therapeutic agent is undoubtedly

explained in part by the sophistication to which it has been subjected. Pharm. Journ. and Pharmacist, October 11, 1913, 530; from Journ. Roy. Soc. Arts, September 12, 1913.

Referring to the preceding article, C. Boyle states that the fruit of the papaya tree is ripe before losing its green hue. The stem and leaves of the tree, the former on tapping and the latter on crushing, will give a certain amount of juice, but the green fruit is, essentially and economically, the source from which papain can most successfully be obtained. The milk exuded from the green fruit is of a pure white color, and, however treated and dried, should lose but little of its original hue in its transition to the marketable commodity. The yellow fruit yields no milk on being broken or cut open. Doubtless, juice is obtainable by crushing, but it will not be milky or white, and cannot compare with the milk of the green fruit. Efficient preparation of pure papain from the green fruit should present no insurmountable difficulties. It should bear a color acceptable to the most critical of importers, and, alike from Eastern and Western islands of origin, a satisfactory supply of the product should be forthcoming. -Ibid., October 27, 1913, 607; from Ibid., September 19, 1913, 974.

#### TAMARISCINEAE.

**Tamarix Pallasii, Desv.**—*Saline Exudation from the Plant.*—Among some specimens received a few years ago at the Indian Museum, Calcutta, from Baluchistan, was a sample of salt said to be yielded by a species of *Tamarix*. Quoting from an Annual Report of the Museum, David Hooper says that these bushes are known to yield a saccharine exudation like manna, but the exudation of a saline substance is remarkable. The sample of salt had the following composition: Volatile matter, 7.7; sodium chloride, 48.7; sodium sulphate, 24.6; calcium chloride, 6.9; iron oxide, etc., 5.0; silica and sand, 7.1 per cent. It is to be inferred that this saline substance is an incrustation left on the plant after the subsidence of the flood water, which in the regions where tamarisks grow is highly charged with mineral salts. Pharm. Journ. and Pharmacist, September 6, 1913, 369.

#### MYRTACEAE.

**Cloves.**—*Cultivation and Collection in Zanzibar.* Captain J. E. E. Craster in an interesting book very recently published, entitled "Pemba, the Spice Island of Zanzibar," gives particulars regarding the cultivation and preparation for the market of cloves



on Pemba, this island and Zanzibar supplying seven-eighths of the world's crop, two-thirds of this falling to the share of Pemba.

The clove tree came originally from the Moluccas, from whence it was introduced into Réunion. From Réunion clove trees were brought to Zanzibar by the Arabs in the early part of the nineteenth century—probably about 1820. Unless the seed is quite fresh when planted it will not grow, and if the seed is transported from place to place it must be carried in water. The young plants grow very slowly, and are not fit to be planted out till they are three or four years old; in their earlier stages they must be carefully shaded from the sun. These difficulties in rearing the clove tree have limited its cultivation, and it is hardly to be found outside Zanzibar and Pemba. In Pemba the clove tree will grow wild, and in abandoned plantations the author found an undergrowth of young, self-sown clove trees, 6 or 8 ft. in height. Yet there are very few countries in the world where the clove will grow at all, for it requires a high temperature all the year round, rain at very frequent intervals, and heavy dew. A month of dry weather with no dew would probably kill the stoutest tree.

The Arabs do not prune the clove trees, but allow them to grow as they will till their branches intermingle and no sunlight can reach the lower parts of the trees; after this the trees only bear on the upper branches, where they can get light and air. As it is very difficult to gather the cloves on the topmost branches of tall trees, a good part of the crop is not picked at all. It has been proved that by cutting off the tops of the trees when they get to a height of about 30 ft. the yield of cloves can be greatly increased. The Arabs do not manure the clove trees in any way, though it would probably pay them to do so. The clove, when ready for picking, is a delicate pink color, but as it dries it becomes dark brown. If it is not picked as soon as it turns pink, the bud at the end will burst and become a little starry white flower. After a day or two the flower fades and falls, the clove swells rapidly, and darkens till it looks like a purple olive. It has a large stone inside, and the flesh is also purple, and tastes of essence of cloves. The fruit is eaten by monkeys, but by no other animal. If cloves are picked after the bud has burst they are not as valuable as before, and if they are left until the fruit has begun to swell it is almost impossible to dry them for the market. Men, women, and children spend their days in the tops of the trees, sitting or standing on a stick lashed across the branches, picking up the bunches of cloves and dropping them into a cloth, the four corners of which are tied round



their necks. Afterwards the cloves are separated from the stems, and spread out on grass mats in front of the houses to dry in the sun.—Chem. and Drugg., November 29, 1913, 825.

**Cloves.**—*Adulteration and Adulterants.*—Mr. Ernest J. Parry contributes an interesting paper on the adulteration of cloves in which he refers primarily to the efforts of the Canadian Departments to erect standards and the conclusions arrived at by the Department chemists upon which recommendations can be made for proper standards. These conclusions, most of which are recommended, are as follows: (1) The total ash not to exceed 8 per cent.; (2) ash insoluble in hydrochloric acid, not more than 0.5 per cent.; (3) volatile oil to be not less than 14 per cent.; (4) total volatile matter, not less than 16 per cent., and may reach 25 per cent.; (5) the fixed oil should be about 10 per cent.; (6) tannic acid, not less than 12 per cent.; (7) crude fiber, not more than 10 per cent.

Continuing, Mr. Parry says that although it appears to be uncommon to find any badly adulterated samples in this country (in England), there can be no doubt that a large number of tons of exhausted, or partially exhausted cloves enter into foreign commerce as genuine cloves. Either a small amount of exhausted cloves in the whole state is added to parcels of whole cloves where it is hoped that they will escape detection, or a much larger amount is added when the spice is sold in a ground condition. In drawing any deductions as to the quality of ground cloves from such figures as the ash or total fiber, it is necessary to see that no starch has been added, since this will reduce both the ash and the fiber; and starch is sometimes added to keep ground cloves in more presentable condition, as the high oil value causes the spice to agglomerate. In regard to the determination of the essential oil, he says that the only really satisfactory method is an experimental distillation of a fairly large quantity and collection and measuring the essential oil.

The following figures relate to a number of the worst samples which he has examined during the past few years, all of which came from abroad, though their actual origin cannot be stated:

	No. 1.	No. 2.	No. 3.	No. 4.	No. 5.	No. 6.
Total ash, per cent.....	7.15	6.2	4.95	8.8	6.9	6.5
Ash insoluble in HCl, per cent....	0.2	0.15	0.22	0.2	0.3	0.28
Total volatile matter, per cent.....	16.8	17.2	16.05	14.8	16.0	15.8
Essential oil distilled, per cent.....	9.8	11.35	10.6	9.0	12.2	12.1
Crude fiber, per cent.....	10.2	9.8	10.8	11.1	10.5	9.0
Tannin, per cent.....	11.0	12.8	13.0	11.0	11.5	13.5
Fixed oil, per cent.....	3.8	4.2	4.2	3.9	2.9	3.0

Each of the above six samples certainly contains some exhausted or partially exhausted cloves, and he is informed from quite reliable sources that the amount of such exhausted cloves dishonestly marketed is enormous.

The use of clove stems as an adulterant, of course, also causes a reduction in the amount of essential oil present, but these can be detected microscopically by the presence of the well-defined stone cells.—Chem. and Drugg., December 20, 1913, 897.

**Eucalypts.**—*Planting for the Drainage of Marshy Soil.*—In an interesting article discussing the question of the planting of eucalypts, in particular with a view of draining the soil, A. Zimmermann, as a result of data collected in several tropical countries, considers himself justified in assuming that it would be worth while to make experiments, in the German colonies as elsewhere, in the draining of marshy districts by planting eucalypts. According to the statements made in the literature of the subject *Eucalyptus rostrata*, *E. robusta*, and perhaps also *E. resinifera* and *E. cornuta* are suitable for this purpose. *E. globulus* on the other hand does not appear to flourish in districts with a purely tropical climate. Schimmel's Semi-Ann. Rep., October, 1913, 54; from Der Pflanze, 9 (1913), 107.

#### ROSACEAE.

**Fragaria Vesca, L.**—*Economic Use of the Rootstocks.*—Quoting from a recent Annual Report of the Indian Museum, Calcutta, David Hooper says that the ground rootstocks of the wild strawberry plants are used as a coffee substitute by the Kashmiri villagers, who cannot afford tea or coffee. The powdered root yielded a somewhat bitter extract containing 9.4 per cent. of tannin.—Pharm. Journ. and Pharmacist, September 6, 1913, 369.

**Hungarian Roses.** *Content of Volatile Oil and Quality.*—Dr. Karl Ilk states that the roses cultivated in Hungaria for the distillation of oil (*Rosa damascena trigintipetala*, *R. gallica* "Perle de Paraché," and *R. moschata trigintipetala*) possess a sweet and agreeable aroma, and yield from 0.0241 to 0.041 per cent. of fine and agreeably odorous volatile oil.—Pharm. Zentralh., (1913), No. 24.

#### LEGUMINOSAE.

**Foreign Leguminous Fruits.** *Anatomical Structure of Varieties Now on the Market.*—Dr. M. Kondo, of Tokio, has investigated a number of foreign leguminous fruits which at the present time

are offered on the market, and describes the anatomical structure of the following: *Glycine soja*, Lieh et. Love.; *Dolichos melanophthalmus*, D. C.; *Vignasincensis*, Endl.; *Dolichos Lablab*, L.; *Canavalia ensiformis*, D. C.; *Lathyrus sativus*, L.; *Cicer arietinum*, L.; *Phaseolus lunatus*, L.; *Phaseolus multiflorus*. A key is appended in the original for the recognition of the seeds described by the author in *Ztschr. f. Unters. d. Nahr. u. Genussm.*, 25, No. 1.

**Sudan Acacia Gums.**—*Their Collection and Commerce.*—Stanley F. Ward, in view of the importation of large quantities of acacia, commonly called "Kordofan sorts," adulterated with other than true Hachab Kordofan gum, communicates an interesting paper, profusely illustrated with original photographs, in which he gives valuable information with regard to the quality of acacias from the various districts of the Sudan, their cultivation, collection, and commerce. He says:

"The gums which are gathered in the Anglo-Egyptian Sudan are divided into two very distinct categories, *viz.*: (1) The gum which exudes from *Acacia Verek* or, as the natives call it, Hachab; (2) the gum which exudes from *Acacia Seyal*, both white and red. This is sometimes called 'Acacia Talka.' These two grades are known and sold only under their native denomination."

**"Gum Hachab."** According to the cultivation of the tree and the nature of the soil, the Hachab gum is divided in the Sudan into two grades or qualities—namely, (1) true Hachab gum (properly so-called); (2) Hachab Gezireh gum. The first gum, Hachab, is the exudation of the cultivated trees, and the second, Hachab Gezireh, comes from the district where the natives do not cultivate the trees, and naturally these two differ in value and are sold at different prices. To go more carefully into this gum, the Hachab description *i. e.*, from the cultivated tree—should again be divided into two other varieties. The first is collected in the districts of Gedareff and Mafaza, where the Hachab tree is cultivated in a district where the soil is very rich, being black earth formed by the alluvions of the Blue Nile and its tributaries; this is called Hachab Gedareff. The second description of true Hachab gum comes from cultivated trees in the district on the left bank of the White Nile. Here the acacia is cultivated in a very sandy soil, somewhat red and ferruginous; this gum is called Hachab Kordofan. It is the gum that is collected from this district—namely, on the left bank of the White Nile—that is the best quality and realizes the highest prices, and, moreover, this district produces more than any

other. This is the gum which is commonly known as Kordofan, and is also sold under the denomination of Gum Acacia, or "Gum Arabic Sorts," without any further description.

"Gum Talka."—This is the exudation of the red or ferruginous *Acacia Seyal* or René Caillé, and of the white acacia or "Soffar" of Schweinfurth, and these trees are found in large numbers in the Sudan. They are not cultivated, and the acacia obtained from them is very inferior to the other descriptions. The native, instead of making a selection and leaving the gum from these two species, collects it indiscriminately and mixes it with other kinds. Therefore it requires a very careful and expert buyer to make sure that when buying Hachab Kordofan gum there is no Talka mixed with it.—Chem. and Drugg., April 26, 1913, 631.

**Balsam of Peru.**—*Tests of Purity and Identity.*—In order to ascertain the reliability of the tests of purity, and the differentiation of pure balsam of Peru from adulterated samples and artificial substitutes, Harold R. Jensen has subjected two samples of the best balsam obtainable (Nos. 1 and 2), an adulterated sample (No. 3), and an artificial balsam (No. 4), to chemical examination, with results shown in the following table:

	(1).	(2).	(3).	Artificial (4).
S. g.....	1.155	1.158	1.151	1.1592
Ref. index (20°).....	1.5948	1.59	1.5775	1.5785
Acid val.....	56	61.6	57	57
Sap. val.....	224.9	231	226.4	232.5
Est. val.....	168.9	169.4	169.4	175.5
Iod. val.....	42.5	42.4	41.6	33.3
Per cent. cinnamein.....	59.3	56	62	60.0
Sap. Val. cinnamein.....	237.5	233.5	242.8	228.3
HNO <sub>3</sub> test.....	Yellow	Transient violet to green	Transient violet	Violet

These figures make it clear how extremely close the usual analytical figures can be obtained by proper tests for products from various sources. Samples 1 and 2 were characterized by their fine odor, particularly No. 1, which is in all probability genuine. The solubility of sample No. 2 amounted to 97.9%. Sample No. 3 was known to be unreliable, and was further subjected to Delphin's test for added fatty matter. No. 4 is an artificial balsam which corresponded uniquely to natural balsams.

In the author's experience, no more useful qualitative test for the detection of synthetic balsam and other additions is yet avail-



able than the color reaction published by Doescher in 1881 for other purposes. This test, when applied to a filtered petroleum-ether extract of the balsam, depends on the production of blue, green, and violet colorations on the addition of  $\text{HNO}_3$  (sp. gr. 1.38) in the presence of the usual adulterants, whereas the best samples of balsam give only a yellow color. All the samples examined gave the fine carmine-red color with strong  $\text{H}_2\text{SO}_4$ , and all were found to have a similar resin content (24 to 26%), estimated by Dieterich's method. The author summarizes the results of his investigations, as follows: The extent of the iodine absorption of the cinnamein, together with the degree of optical activity of the first 30 per cent. of distillate obtained by its fractionation (not necessarily a vacuum distillate), may be useful and necessary factors, together with the customary analysis, in estimating between quite genuine Peruvian balsam and samples of the same diluted with artificial and other balsams. The fractions of the synthetic cinnamein are, of course, practically pure benzyl benzoate, which is differentiated from the natural cinnamein by the following constants:

**Benzyl Benzoate:** Sp. gr., 1.121; b. p.,  $320^\circ$  app. ( $173^\circ$ , 9 Mm.); sap. val., 264.1.

**Benzyl Cinnamate:** Sp. gr., 1.098; b. p.,  $360^\circ$  app. ( $213^\circ$ – $214^\circ$ , 9 Mm.); sap. val., 235.1.—Pharm. Journ. and Pharmacist, Feb. 15, 1913, 210–211.

**Balsam of Peru and Perugen.**—*Difficult Differentiation by the G. P. Constants for the Natural Product.*—K. Enz observes that the products offered on the market under the name of "Perugen" as substitutes for natural balsam of Peru, are modernly so skillfully prepared that the two substances are with difficulty differentiated. The natural balsams at present on the Hamburg and Bremen markets, which are easily obtained of guaranteed purity, he finds to respond to the pharmacopœial (G. P.) requirements in all respects, except the specific gravity, which has in recent years shown a disposition to become higher. While in 1897 the lower and upper limits were given as 1.135 and 1.145, respectively, the G. P. V now gives the lower limit as 1.145 and the upper as 1.158—the latter being of most frequent occurrence and sometimes even exceeded to as high as 1.165.

Regarding the recognition of the Perugens as now perfected and offered on the market, the author says that the only G. P. constants available are: (1) The determination of the acid number; (2)

the determination of the iodine number and of the isolated cinnamoin; (3) the nitric acid reaction; and (4) the behavior of the product with petroleum ether. The other pharmacopœial constants or tests are of little or no value in this connection.—Pharm. Ztg., lviii (1913), No. 82, 821; from Südd. Ap. Ztg., 1913, No. 73.

**Hardwickia Balsam.**—*Differentiation from Gurjun Balsam and Copaiba.*—In a paper contributed to Gehe & Co.'s "Handelsbericht," 1913, Professor Ed. Schaer directs attention to the possible use of the balsam of *Hardwickia pinnata* as an adulterant for copaiba, from which it is differentiated by its marked viscosity and its very dark color—light cherry-red by transmitted light, nearly black-red in reflected light. When subjected to the G. P. test for gurjun balsam (super-imposing a layer of solution of the balsam in glacial acetic acid containing a little sodium nitrite on a layer of concentrated sulphuric acid), Hardwickia balsam, in contrast to gurjun balsam, does not develop a violet color in the acetic acid layer, but a dark olive-green to blue-green coloration. It is notable also that the solution of Hardwickia balsam in glacial acetic acid, which by transmitted light is greenish, exhibits by reflected light (over a dark surface) a purple-red coloration or fluorescence, whereby it is distinguished from both copaiba and gurjun balsam. In other reactions, also, Hardwickia balsam is distinguished from gurjun balsam, but Professor Schaer is of opinion that for the recognition of a substitution or adulteration of copaiba the characteristic coloration and fluorescence in concentrated glacial acetic acid solution is the only reliable test available, and then only in case of large admixtures with copaiba.—Pharm. Ztg., lviii (1913), No. 33, 328.

**Lathyrus Sativus.**—*A Poisonous Horse Pea.*—E. M. Holmes calls attention to an East India fodder pea, which is extensively imported into England, under the name of "mutters," sometimes by itself, but more extensively as a contaminant of the so-called "Indian Peas," and usually present to the amount of 20 to 30%, but sometimes to 35 or even 40%. This seed, which is derived from *Lathyrus sativus*, is reputed, with apparent justification, to be poisonous, and according to authorities on the subject, should not be given as fodder if present in "Indian Peas" to the amount of 13.2%, while 15% is regarded as dangerous, and if continued for a long time would be poisonous. It is believed that  $\frac{3}{4}$  lb. per day consumed by horses would produce fatal symptoms.

The name "mutters," unfortunately, is one that is used at

Calcutta and the eastern part of India generally as the distinctive name of the harmless non-poisonous field peas, or "Dhesi mutter" (*Pisum arvense*, Lin.), and the garden pea (*Pisum sativum*, Lin.), or Ghol mutter, but in Central and Northwest India the name of mutter or mater is applied to *Lathyrus sativus*, Lin., just in the same way that we apply the name sweet "pea" to another *Lathyrus* (*L. odoratus*), the term vetchling being the English equivalent of *Lathyrus*. This use of the word mutter or mater extends to Scinde, and its port, Kurrachee, whence, as being a nearer port than Calcutta, the *Lathyrus sativus* is shipped, and hence the name of the non-poisonous genuine peas, *Pisum sativum* and *P. arvense*, is applied to the poisonous seeds of *Lathyrus sativus*. The correct Hindustani name of *Lathyrus sativus* is KASARI, and if this name, or, better still, the botanical name only, were applied to it in English commerce it would be easier for farmers to ascertain what they are buying.

There are several varieties of the *Lathyrus sativus*, one white, another with purplish, a third with blue flowers, and another form with narrow leaves, and similarly there are also varieties of the seed as met with in those imported from different districts of India. They also vary in size and markings. These are all, however, easily distinguished from all other commercial varieties of "peas" by the curious angular shape, which is that of a short, thick wedge. At the thicker end there is seen a small, oval scar or hilum near one corner, and not far from it a raised, dark polished point; from this there runs, in several varieties, a dark line which is continued round the seed along the middle of its narrow edge, so that the seed is rectangular at the back, flattened at the two sides, and tapers down from the back to a thin, obtuse edge in front. On account of its shape, when mixed with peas and placed on an inclined plane the round peas roll off, but the *Lathyrus sativus* does not. Hence they are separable with comparative ease. For the same reason, when the mixed seeds are poured from one vessel into another they become unequally mixed. The commonest form of *Lathyrus sativus* seeds imported into England are greyish green in color, speckled or mottled with darker spots and lines, which are sometimes so crowded as to give a blackish tint to the seeds, but in other varieties, as in the brown, uniformly blackish and pale varieties, are not so noticeable. The dark line round the edge is not noticeable in the brown, blackish, or the large white variety that comes from the Baltic under the name of Riga pea, which is often met with in chickens' food. In size the seeds vary from 2-3 Mm. broad and 2 Mm. deep at the thicker end to 4-5 Mm. broad and 4 deep. This



is the ordinary size of which the bulk of the "mutters" or Indian seeds of *Lathyrus sativus* consists. Mr. Holmes concludes that whether or not the poisonous principle of these seeds is destroyed by a boiling temperature, the seed cannot be regarded otherwise than dangerous and not fit food for man or beast.—Pharm. Journ. and Pharmacist, June 7, 1913, 795.

**Syrian Licorice Root.**—*Occurrence, Collection and Commerce.*—The "Chemist and Druggist," using information received from Mr. John D. Whiting, of the American Colony, Jerusalem, gives some interesting particulars regarding the occurrence, collection and preparation for the market of licorice root in Asia Minor, from which it appears that in Syria the licorice plant (*Glycyrrhiza glabra*) is not cultivated, but is found growing wild in large quantities, usually in stretches of open land where the soil is of a damp and marshy character. It is regarded by the natives as a serious pest, greatly interfering with cereal cultivation, much of the land being abandoned to it. The growth of the plant above ground is about 2 ft., and there is usually another 2 ft. of root beneath the soil. The land in Syria from which licorice is gathered is leased from the owners, the conditions in regard to lands that are also devoted to cereals being that the digging out of the root must cease when the time for planting crops arrives. The result is, as far as these lands are concerned, that the digging must be done quickly—that is, as soon as the rains which usually fall in October have moistened the ground; otherwise it would be very difficult to obtain the root in the long, dry summer.

The collecting stations in Asia Minor are at Antioch, Aleppo, Bagdad, and Damascus; other stations belonging to the company are in the Smyrna district, as well as in parts of Russia. Near the main stations are smaller depots located in the fields, each in charge of a native whose duty is to receive and guard the licorice as brought in by the collectors. The root is dug out with primitive picks similar to those in use in biblical times; it is brought to the stations by donkeys, where it is immediately weighed; payment is made according to weight, and the collectors give a receipt for the amount delivered. Travelling cashiers on horses visit the depots, collecting and paying for the receipts. The root is afterwards piled in huge stacks, such as is shown in one of the numerous illustrations accompanying the paper. When the digging season is ended a watchman takes charge, and the root remains thus throughout the winter and the following summer, by which time it is quite dry and is ready for transportation to the coast. Great care has



to be exercised that the stacks do not become heated or mildewed. One of the greatest questions involved is that of transport—*e. g.*, all the root from the Aleppo and Antioch districts has to be carried to the seaport of Alexandretta by camel, two huge bags making a load. The transportation is done by contract with Bedouins from near Hamma. At Alexandretta, the licorice root is pressed into bales, for export, and a certain amount of the root is converted into extract.—Chem. and Drugg., May 24, 1913, 773.

**Powdered Licorice Root.**—*Examination of Commercial Sorts.*—Henry G. Greenish and Dorothy J. Bartlett have made an examination of the powdered licorice root of commerce with the view of ascertaining to what extent the powder was prepared from root of the quality required by the B. P. Preliminarily they determined the yield of aqueous extract and ash in commercial samples of root representing the varieties occurring in commerce. The aqueous extract was determined by shaking 5 Gm. of the powdered root frequently during twenty-four hours with 100 Cc. of chloroform water, filtering, evaporating 20 Cc. of the filtrate in a flat-bottomed nickel dish, and drying at 100°. The ash was calculated on the drug dried at 100°. The results were as follows:

Licorice Root.	Aq. Ext.	Ash.
1. Spanish.....	24.9	3.5
2. French.....	28.6	3.8
3. Sicilian.....	32.5	5.2
4. Turkish.....	37.1	3.7
5. Anatolian.....	24.4	7.8
6. Persian, large.....	24.3	4.7
7. Persian, small.....	32.4	3.3
8. Russian.....	28.9	3.6
9. Russian.....	38.3	6.4

The authors then examined 32 samples of powdered licorice root obtained in various parts of the United Kingdom. The moisture was determined by drying 1 Gm. for two hours in a steam oven. Each sample was also examined microscopically. The following results obtained are shown in the table on page 246.

The Committee of Reference in Pharmacy has recommended that licorice root should yield not less than 20% of aqueous extract and not more than 6 per cent. of ash. In three out of the thirty-two samples examined the amount of aqueous extract falls below this recommendation, and in nine the limit of ash is exceeded. The microscopical examination shows that six are undoubtedly adulterated, two have admixtures that are probably accidental, and four are prepared from roots of very low quality

## EXAMINATION OF POWDERED LICORICE ROOT.

	Aq. Ext.	Moisture.	Ash.	Microscopical Examination.
1	24.1	13.4	7.4	Abundant cork tissue and brown particles
2	18.2	9.8	5.5	Similar. Also contains fragments of wood
3	27.7	11.9	5.3	Few brown particles; fragment of cruciferous seed
4	16.4	10.8	5.5	Abundant cork tissue and brown particles
5	41.0	10.0	5.8	Normal
6	35.9	11.0	6.2	Normal
7	30.8	10.5	5.3	Normal
8	29.5	12.0	6.4	Normal
9	27.8	10.4	5.0	Not quite pure; few extraneous starch grains and sclerenchymatous cells
10	28.5	9.6	3.8	Occasional brown particle
11	28.9	11.2	7.2	Normal
12	31.4	9.3	7.1	Several brown particles
13	18.9	9.3	6.6	Numerous brown particles; fragment of endosperm of cereal
14	28.6	10.0	4.4	Normal
15	22.2	9.9	4.7	Few brown particles
16	38.5	9.9	4.6	Very little licorice starch, fair admixture of barley meal
17	28.1	13.7	4.6	Few brown particles
18	25.5	11.0	5.9	Few brown particles
19	33.6	10.6	6.3	Normal
20	43.7	9.6	4.4	Admixture of barley meal
21	38.1	9.5	4.9	Admixture of barley meal; fragments of leaf
22	29.0	9.0	3.5	Normal
23	31.7	8.2	5.4	Normal
24	35.2	9.8	6.7	Normal
25	30.1	7.5	6.0	Extraneous tissues (? pear meal)
26	38.4	7.4	4.4	Normal
27	35.4	9.3	4.2	Admixture of barley meal
28	36.4	7.5	4.3	Normal
29	27.4	10.7	4.4	Normal
30	26.9	8.4	4.7	Normal
31	25.0	8.5	5.5	Normal
32	35.1	8.0	6.3	Very little licorice starch, fair admixture of barley meal

Fifteen are prepared from roots practically free from dark patches, but six of these exceed the limit of ash, though not to any serious extent. In no case was the presence of powdered almond shells, sometimes found in foreign-ground drugs, to be detected. The authors conclude that there can be little doubt that these unsatisfactory results are due to the purchase, at a low price, of powders of inferior quality, as there is no difficulty in obtaining a powder of good quality if a reasonable price is paid. Powdered licorice root may well be required to be pale yellow in color and to yield not less than 20 per cent. of aqueous extract and not more than 6

per cent. of ash. The B. P. describes the drug as the peeled root and peeled subterranean stem of *Glycyrrhiza glabra*, Linn., and other species. Every variety of licorice root is, therefore, official, provided it complies with the official characters. —Pharm. Journ. and Pharmacist, March 15, 1913, 365.

**Lignum Nephriticum.**—*Botanical Source.*—Hans Jacob Möller contributes a comprehensive study, undertaken to determine the botanical source of the so-called *Lignum nephriticum*, an American wood the parent plant of which has hitherto been unknown. He has gathered the information respecting this wood that has appeared in the literature and, on the basis of comparative examinations of the heartwood of the plants that have been mentioned as the source of *Lignum nephriticum Mexicanum*, has determined that none of the 12 hypothetical plants mentioned by different authorities can be regarded as the parent plant yielding this wood, which his experiments prove to be derived from a Mexican species of *Pterocarpus*. He finds that the heartwood of all the *Pterocarpus* species examined by him—and only the heartwood—gives with lime water the characteristic sky-blue fluorescence, which characterizes the Mexican *Lignum nephriticum*, and that two varieties appear to exist, both described by F. Hernandez; the one designated as “Coatlís,” derived from *Pterocarpus amphymentium* D. C. (*Amphymentium pubescens*, H. B. et K.; *Pterocarpus pubescens*, Sprengel); the other, designated “Quauhchinacensis,” probably from *Pterocarpus orbiculatus*, D. C.

Other botanical investigations, which have been made by E. D. Merrills, point out that

**Philippine Lignum Nephriticum** is derived from *Pterocarpus Indicus*, Willdenow, and *P. echinatus*, Tesson, while

**Brazilian Lignum Nephriticum Nigrum** is in all probability derived from *Pterocarpus violaceus*, Vogel.—Pharm. Ztg., lviii (1913), No. 22, 217; from Ber. d. d. Pharm. Ges., 1913, No. 2.

**Phaseolus Multiflorus.**—*Chemical Examination of the Roots.*—In Lindley and Moore's “Treasury of Botany” there is a statement regarding the “scarlet runner bean” (*Phaseolus multiflorus*) to the effect that the roots are narcotic and poisonous. Inasmuch as the scarlet runner bean is largely used as a culinary vegetable, it seemed of interest to ascertain whether the properties attributed to the roots could be confirmed by chemical examination and physiological tests, and Dr. F. B. Power and Mr. Arthur H. Salway have undertaken this with the following results.

The material used for this investigation was obtained from plants cultivated at Dartford, Kent, and was collected in the early autumn. It consisted of the roots with a small portion of the aerial stem attached, and represented the variety of the plant bearing scarlet flowers. The fresh material, on drying, lost about three-fourths of its weight. Although the amount of air-dried material available was but about 2 kilograms, the following constituents were isolated or identified:

(I) An enzyme, which readily hydrolyzed amygdalin; (II) a small amount of an essential oil; (III) furan- $\beta$ -carboxylic acid,  $C_5H_4O_3$ , which was first isolated quite recently from the bark of *Euonymus atropurpureus*; (IV) allantoin,  $C_4H_6O_3N_4$ , which has previously been found in several animal and vegetable products, and not long ago was shown by Titherley to be a constituent of comfrey-root; (V) a phytosterol,  $C_{27}H_{46}O$ , and apparently a little pentatriacontane,  $C_{35}H_{72}$ ; (VI) a small amount of substance having the characters of a phytosterolin (phytosterol glucoside); (VII) a new crystalline glucoside, designated phaseosaponin,  $C_{50}H_{84}O_{20}$ , which on hydrolysis was resolved into a substance, phaseosapogenin,  $C_{26}H_{44}O_4$ , and a sugar which appeared to be rhamnose; (VIII) a mixture of solid and liquid fatty acids. The roots also contained, besides some resin and amorphous glucosidic material, a quantity of sugar which yielded *d*-phenylglucosazone. No alkaloid was present, nor could any trace of a compound capable of yielding hydrogen cyanide be detected.

Physiological tests, in conjunction with the chemical examination, have afforded no evidence that the roots of the scarlet runner bean possess the toxic properties ascribed to them. Whether the plant in a wild state, or cultivated in a tropical climate, may produce roots which exhibit poisonous properties, the authors are at present unable to determine.—Chem. and Drugg., April 12, 1913, 544.

**Soya Beans.**—*Structure.*—In an elaborate paper presented at the 1913 meeting of the British Pharmaceutical Conference, T. E. Wallis communicates a complete histological study of the soya bean, illustrated by seven drawings of sections and of powder as revealed under the microscopic lens. The material consisted of beans of a pale yellow color, with not more than 1% of darker-colored beans (black or brown), averaging 8 Mm. in length, 7 Mm. in breadth, and 6 Mm. in thickness, consequently roundly ovoid in shape. The hilum is about 3 to 4 Mm. long, and found in the middle of the longer edges of the bean. When soaked in water the beans



expanded unevenly, so that after soaking they were more kidney-shaped, increasing 65% in length, 17% in breadth, and 3.3% in thickness. Some commercial samples of meal and press-cake were included in the examination, which is of commercial importance chiefly, and owing to its great length must be consulted in the original.—Trans. Brit. Pharm. Conf. (Yearbook of Pharmacy), 1913, 467-476.

**Sarcocolla.**—*A Remarkable Eastern Drug.*—David Hooper describes "Sarcocolla," an oriental drug remarkable for its supposed virtues in agglutinating wounds, which is derived from a plant identified at Kew as

**Astragalus Fasciculifolius**, Boissier. The common name of the drug at Bombay is "Guzar;" in Persian it is called "Kun-judah" or "Gunjidah," and in Arabic "Anzarut" or "Unjeroot." The plant is a tall shrub, with long, white, hoary tomentose spines; the pod is as large as a grain of rice in the husk, covered with a tomentum of white, cotton-like down, consisting of long simple hairs matted together; some of the pods are abortive and full of gum. The seed is vetch-like, and  $\frac{1}{8}$  in. in diameter; when soaked in water it swells and bursts, and a mass of gum protrudes. The bushes grow in the hot region of the province of Fars at Firozabad, Fassa, Gawan, Istabbarat, the Shiraz Mountains, and beyond Saadu. The gum forms on the twigs and branches, and is collected in July during the wheat harvest, and it is said that the more frequently the gum is removed the whiter it becomes. The drug consists of spongy, light yellow gummy or resinous grains, from the size of a pea to a sandy powder. It has the appearance of crushed resin, bread-crumbs, or a form of brown sugar, but more irregular. The tears are whitish, yellowish, or red; the whitish, being the freshest, are preferred. The drug has no odor; the taste is sharp and sweetish, followed by a nauseous and disagreeable bitterness. The gum softens in the mouth and dissolves almost entirely in water. Sarcocolla was known to the Arabian physicians of the tenth century, who supposed it to have virtues, applied externally, in curing wounds. It is a Moghul medicine, and is used specially by Yunani physicians throughout India. In Persia, it is used for adulterating opium, for securing the corks of large glass flagons in which rose water is exported, and is eaten by ladies of the harem to improve their appearance and to give the skin a glow. A sample of Gunjidah from Bushire had the following composition: Moisture 10; soluble in 90 per cent. alcohol, 74; soluble in water,

5.3; insoluble fiber, 8.4; ash, 2.3 per cent.; nitrogen, 0.44 per cent. Sarcocollin, or the alcoholic extract of sarcocolla, has the properties of a glucoside. A combustion of the absolutely dried and ash-free alcoholic extract gave the following percentage composition: Carbon, 57.28; hydrogen, 8.50; oxygen, 34.22. Sarcocollin resembles glycyrrhizin, but differs from it in that its aqueous solution is not precipitated by dilute mineral acids; and it differs from the ordinary saponins in the large proportion of the insoluble hydrolyzed product. The occurrence of a glucosidal gum is peculiar in the vegetable kingdom, and it is proposed to submit its properties and composition to further chemical investigation.—Pharm. Journ. and Pharmacist, October 18, 1913, 573; from Journ. and Proc., Asiatic Soc. Bengal, 14 (1913), No. 4, 177.

**Senna.**—*Chemistry.*—R. Tambach reviews the history of senna. Lassaigne and Feneulle first prepared from Alexandria senna cathartin, soluble in water and alcohol. Bley and Diesel isolated chrysoretin, and Mortius prepared the impure chrysophanic acid, which was later analyzed by Keussler, and was found to be emodin. In 1900, A. Tschirch and E. Hiepe published their valuable researches on senna leaves. They isolated anthraglycosennin. This body, by numerous methods, was again split up into the following: senna-emodin, senna-chrysophanic acid, glycosennin, senna-isomodrin, senna-rhamnetin and senna-nigrin. Tschirch and Hiepe also perfected an assay process for senna.

Aweng claims that cathartinic acid is the active constituent in the glucosides of senna, which can be arranged in two classes, one of which gives a yellow rhamnetin reaction with alkalis, and the other a red oxymethylantraquinone reaction.

Knoll & Co., in 1908, patented a process whereby the active constituents are isolated. These are named sennax, consisting of two parts, namely: senna-glucoside, a yellowish, amorphous powder, soluble in water, and in diluted alcohol; and sennoid, insoluble in water but soluble with dark color in diluted alkalis.—Ph. Zhalle., 1913, No. 27. (O. R.)

**Powdered Senna.**—*Examination of Samples on the London Market.*—Henry G. Greenish and Dorothy J. Bartlett report the results of examination of a number of samples of powdered senna on the London market. Practically only Alexandrian and Tinnivelly are received in this market, both, and particularly the latter, occurring in various grades, in addition to broken leaf, small, and siftings. The lower qualities, especially the Tinnivelly leaves,

are dull in color and often marked with dark patches, the tissues of which these patches consist having a dark, reddish brown color, under the microscope. It was considered sufficient to determine the moisture and ash and to examine the powder (20 samples) under the microscope. The results show that there is a disposition to purchase low-grade powders. The moisture ranged from 7 to 10.5%—the average being about 9%. The ash ranged from 8.2 to 22.4% (average 12.2%); while the microscopic examination showed four green samples regarded as good, one sample green but containing too much sand, three pure, but brownish in color, two containing stalk, others containing more or less sand, and one containing fruit, seed, stalk and much sand.—Pharm. Journ. and Pharmacist, March 15, 1913, 366.

**Tragacanth.**—*Observations on Testing.*—H. R. Jensen observes that the commercial grading of tragacanth appears at present to be conducted in rather a haphazard fashion and based on opinion. The true valuation is a matter of some difficulty and depends not only on freedom from color, but also on the viscous strength of the solutions, for this is the specific property of the substance and its great importance will be at once recognized. Whether variations are entirely attributable to methods and conditions during collection is uncertain, and it has been inconvenient, if not impossible, to average and comparatively gauge the same in any reliable manner in routine testing, especially with the tough specimens of Smyrna gums containing thick pieces of the "hog" type, possibly derived from *Astragalus Heratensis* and other unofficial species. It has been observed that the cruder samples of gums, sometimes the result of exposure to wet in collection, invariably give color reactions, having as their basis the presence of oxidizing enzymes. As to whether this is a natural condition or not cannot be stated, but it may be significant that gum acacia has a pronounced oxydase content, and that such catalysts are entirely absent from the finest Syrian grades of thin flake tragacanth.

For the detection of acacia in the powdered tragacanth, the author suggests the enzyme reaction proposed by Payet in 1906, which is as follows:

"Five Cc. 3 per cent. tragacanth solution and 5 Cc. 1 per cent. guaiacol solution, with 1 drop  $H_2O_2$  solution, in the presence of peroxydases (acacia) produces a yellow to brown color in within five or ten minutes.

"Similarly, 10 Cc. 3 per cent. tragacanth solution, with 2 to 3 drops of guaiacum resin solution (alcoholic), in the presence of



of oxydases (acacia), gives a marked blue color within five to thirty minutes."

The more highly colored portions have been frequently observed to give the strongest enzyme reactions and to have the lowest viscous power. Other adulterants, which have been described as frequently occurring, are the Indian tragacanth, the gums from *Cochlospermum Gossypium* and *Sterculias*. These can to some extent be detected by the peculiar stringy character of the borax jelly, but more certainly by a steam distillation after treatment with phosphoric acid, the yield of acetic acid being then about seven times that from true tragacanth.

The saponification value, also, is useful owing to the acidic constitution that tragacanth and gums of its class possess, which exert a notable combination with potassium hydroxide, while acacia, as shown by experiment, absorbs very little. Specific directions are given to carry out this test.

The results of the tests indicated, as carried out on 12 commercial specimens, are given in a table. They show that 4 of the gums may be taken as quite genuine and of the highest excellence, all of the others being of second grade, and three of these were found to have a very low viscosity. In the second-grade samples oxydases predominate, pointing to the presence of acacia. Starches other than the natural were not identified, but some of them indicated a content of about 5%. Of Indian tragacanth, one absolutely authentic sample of *Cochlospermum Gossypium* gum had sap. value 122.7 (in No. 90 powder); it gave no reactions for oxidizing enzymes, nor did a sample of true *Sterculia urens* gum. The principle of the investigation is apparently of some real value in the examination of ground gums and their mixtures.—Chem. and Drugg., April 19, 1913, 575.

**Tragacanth.**—*Adulteration with "Indian Gum."*—Gehe & Co. observe that by reason of the white color of the powder, the so-called "Indian Gum" has modernly become a popular substitute for powdered tragacanth. In pieces this gum is easily distinguished from tragacanth, because of its transparency, shows no ribbon forms, and is irregularly furrowed. By itself, the powdered "Indian Gum" is also easily recognized, since it yields on shaking with water a transparent and very acid mucilage. Moreover, under the microscope the powder is recognized by the presence of numerous stone-cells from the bark fragments adhering to the gum; but in admixtures with genuine tragacanth, the determination of the adulterant is more difficult. Here borax facili-



tates the recognition of the adulterant, however. If 2.0 Gm. of the suspected powder is moistened with alcohol in a 100 Cc. cylinder and the mixture shaken with 50 Cc. of water until the powder is equally distributed, and 50 Cc. of a 4% solution of borax is then added, a mucilage is formed on standing over night, which, if the tragacanth powder is genuine, may be readily poured from the cylinder without drawing threads; whereas, if the powder contains "Indian Gum," a tough, viscous mass is produced.—Pharm. Ztg., lviii (1913), No. 33, 328; from Gehe & Co., Handelsbericht, 1913.

## TEREBINTHACEAE.

**Canarium Prolyphyllum.**—*A New Oil-Fruit from German New Guinea.*—Krause directs attention to the economic value of *Canarium prolyphyllum*, a tree which occurs very commonly throughout German New Guinea. The fleshy fruit encloses one (rarely two) seed, a brown nut covered with a hard brown skin, which has been examined by the author with the following results: Ten nuts weighed with the hard rind, 93 Gm.; without the rind, 21 Gm. On extraction with ether the seeds yielded 68.2 per cent. of fat, leaving a residue which contained 61 per cent. of protein. The analytical data of the fat were: Solidifying point, 19°–20°, melting point, 30°, sapon. value, 200.2, iodine number, 59.7, Reichert-Meissl number, 4.4. The nuts are eaten freely by the natives, and the author shows that no poisonous or deleterious substance is present in the residue after ether extraction. It is suggested that the fat should find a use for the manufacture of margarine, and the residue would prove a valuable feedingstuff. Other species of *Canarium* are indigenous to the Malay Islands and yield the commercial Java almond oil.—Apoth. Ztg., 28 (1913), 222; from Tropenpflanzer, 1913, No. 3, 147.

**Elemi.**—*Resins from West Africa.*—Dr. Karl Dieterich reported on the elemi resins of Kamerun before the 85th Annual Convention of the German Naturalists in Vienna, 1913. He divides these resins into an elemi proper, which contains amyryl, the other class not containing this constituent. The botanical source of elemi has thus far not been discovered. Through the courtesy of Dr. Mansfield, in Ossidinge Kamerun, Dr. Karl Dieterich came into possession of two samples, one of which was soft, and the other hard. These were reported on as to their physical properties, including their solubility, ash, acid and saponification number, and their constituents.—Ph. Zhalle., 1913, No. 39. (O. R.)

**"Hotai" and "Dakh."**—*Two Saponaceous Gums Imported into Bombay.*—Quoting from the Annual Report of the Industrial Section of the Indian Museum, Calcutta, David Hooper writes that *Balsamodendron Playfairii*, a shrub growing on the Somali coast, yields a peculiar soapy gum, called "Hotai," which is sent in large quantities to Bombay. It disintegrates in water, forming a persistent lather, and is used for washing the hair. It contains an acid resin, soluble in ether and alcohol, and a saponin. Another substance of a similar nature, called "Dakh," was collected on tour in Kurachi. It is brought from the Mekran coast, Persian Gulf, and is there used by women for washing the hair. It differs from the former gum in its appearance and composition, but contains a resin and saponin. The following characters serve to distinguish the two gums: Hotai is liver colored and opaque, Dakh is reddish brown and translucent; Hotai dissolves and forms an emulsion with water, Dakh swells in water owing to the presence of an insoluble gum; Hotai contains a resin acid in reaction, Dakh yields a resin almost neutral in reaction. —Pharm. Journ. and Pharmacist, September 6, 1913, 369.

**Myrrh of Commerce.**—*Modern Source.*—E. M. Holmes, in a paper on "The Myrrh of Commerce, Ancient and Modern," read at the British Pharmaceutical Conference, 1913, observes that it has generally been taken for granted that the Myrrh of Scripture is the medicinal myrrh, but that this, in his opinion, is not so. He points out that the Hebrew word "Lôṭ," translated myrrh in Genesis, in reality refers to labdanum, while "Môr," the Hebrew word for myrrh in the Psalms and Canticles, is perfumed myrrh, derived from *Commiphora erythroca* var. *glabrescens*, Engl., which is collected in the Ogaden country, south of Somaliland, and is sent from Somaliland ports, chiefly Berbera, to Bombay, and thence to China.

The medicinal myrrh of modern commerce, on the other hand, is the product of *Commiphora myrrha*, Holmes (Journ. Bot., July, 1913). This is well known to be frequently mixed with other resins, which are generally picked out in the wholesale trade and sold as "bdellium." The actual verification of the botanical origin of this Somali myrrh, which has long been in controversy owing to the difficulty of securing reliable herbarium specimens of the plant, Mr. Holmes owes to the kindness of Mr. and Mrs. Lort Phillips, who brought him specimens of leafy twigs of the tree with fruits, as well as bark off the same tree as the twigs. They also ascertained that the Somali name of the tree is "Didthin," and that of myrrh

"Mal-mal," thus confirming previous statements made by Lieutenant Wykeham Perry, and by the German traveller Hildebrandt. To this Dr. Drake Brockman (in a recent work on Somaliland) has added that the Somalis distinguish two kinds of myrrh:

(1) *Guban Myrrh*, obtained from the torrid, low-lying, hilly plains extending inland as far as the mountain ranges; and

(2) *Ogo Myrrh*, collected on the mountain ranges of the interior.

Dr. Brockman has since also informed Mr. Holmes that he finds the Somalis differentiate two kinds of myrrh trees on the maritime plain, one of which they call "Didthin madow" (black), the other "Didthin ad" (white); the leaves of the latter being narrower and slightly toothed and pale green, as represented in specimens sent to Kew, while the leaves of "Didthin madow" are broader, nearly entire, and of a dull, deeper green color; but, so far as he has observed, there seems to be little, if any, difference in the myrrh they yield.

The tree which produces the "Guban Mal-mal" seldom exceeds the height of 4 or 5 ft., and is usually to be found on stony rises or hills. The gum is collected during the hot summer months, when the tree is in a leafless condition, and is always of a bright treacle-red color owing to its more oily consistency, occurring as numberless rounded tears or drops seemingly, varying in size from a pin's head to a pea, giving the whole mass a very irregular shape, and never getting the powdery appearance characteristic of the Ogo variety. It is also distinctly less bitter. The flowers are the first to appear, and are rapidly followed by the leaves in August or early September; the seeds are ripe in January.

The tree yielding the "Ogo Mal-mal" is, according to the Somalis, identical with the "Didthin," but grows to a greater size, and the superiority of the Ogo myrrh is due to the fact that it is the product of a much finer tree, which attains a height of 15 ft. and spreads its branches over a diameter of 20 ft., the trunk being quite 1 ft. in diameter. The Ogo myrrh has a much drier and more friable appearance than the Guban variety, when freshly gathered, and after it has travelled to the coast the pieces present a rough surface, the interstices being filled with a pale yellow powder. Trans. Brit. Pharm. Conf. (Yearbook of Pharmacy), 1913, 451-455.

**Pistacia Terebinthus.** *Examination of the Resins.*—L. Reutter has examined an Egyptian sample of the resin of *Pistacia terebinthus*, var. *Palæstina*. This is an adhesive mass, more or less solid on the exterior and soft on the interior. It has a balsamic



terebinthinate odor, is completely soluble in chloroform, potassium hydroxide solution and carbon disulphide, 75 per cent. soluble in oil of turpentine and in alcohol, sparingly soluble in benzol and almost insoluble in petroleum ether. The resin melts at  $70^{\circ}$ – $71^{\circ}$  C., its acid number is 129 to 130, its saponification number is 235 to 241; and its ester number is 106 to 110.

From 150 grams of the resin, Reutter obtained 17.6 grams of volatile oil, 3.6 grams of resin acid, soluble in ammonium carbonate solution, 63.5 grams of resin acids soluble in sodium carbonate solution, 2.5 grams of resin acids soluble in potassium hydroxide solution, 45.9 grams of alcohol-soluble saponifiable portion, 3.5 grams of material insoluble in ether and 12.8 grams of ligneous and mineral fragments.

The volatile oil has a density of 0.8516, a rotary power of  $-17^{\circ} 18'$ , and a refractive index of 1.4622. On redistillation it was easily separable into several fractions. Following the Tschirch plan of resin separation, the ammonium carbonate extract yields a crystalline body melting at  $104^{\circ}$  C. having the composition  $C_{15}H_{26}O_3$ . This substance has been named *pistacinic acid*. The sodium carbonate extract is partly soluble in ethyl alcohol and partly soluble in methyl alcohol. From the former solvent colorless crystals melting at  $148^{\circ}$  and having the formula  $C_{24}H_{42}O_3$  are obtained, which have been named *pistacolic acid*. From the alcoholic solution was also obtained an amorphous body, *beta-pistacolic acid*,  $C_{27}H_{34}O_3$ , melting at  $148^{\circ}$ – $149^{\circ}$  and showing an acid number of 101, as well as a second amorphous body, *alpha-pistacolic acid*, melting at  $91^{\circ}$ – $92^{\circ}$ . From the portion soluble in methyl alcohol, two acids were obtained: *pistacinolic acid*,  $C_{22}H_{38}O_2$ , melting at  $138^{\circ}$ , and *alpha-pistacinolic acid*, melting at  $103^{\circ}$  to  $104^{\circ}$  C.

The saponifiable portion on precipitation by addition of acid, is partly soluble in ether and partly in alcohol. The ether-soluble portion yields four crystalline bodies: *alpha-terebenthic acid*,  $C_{26}H_{44}O_3$ , melting at  $110^{\circ}$ – $111^{\circ}$  C.; *beta-terebenthic acid*,  $C_{21}H_{26}O_3$ , melting at  $82.5^{\circ}$ – $84^{\circ}$  C. and having an acid number of 78; *alpha-pistacia-resene*,  $C_{29}H_{48}O_3$ , melting at  $103^{\circ}$ – $104^{\circ}$  C., and *beta-pistacia-resene*,  $C_{18}H_{26}O_3$ , melting at  $96^{\circ}$ – $97.5^{\circ}$  C.

The ether-insoluble, alcohol-soluble portion yields a crystalline body called terebenthino resene,  $C_{19}H_{27}O_3$ , melting at  $79^{\circ}$ – $81.5^{\circ}$ .—Schweiz. Wschr. f. Chem. u. Pharm., 51 (1913), No. 36, 537. (H. V. A.)

**Rhus Glabra Fruits.** *Substitution by Fruits of Rhus Typhina.*—Prof. Henry Kraemer calls attention to the above substitution



and says: "This replacement of one drug by another would seem to be rather common at present, yet it may be not more than was formerly the case. A careful study of even some of the official drugs on the market shows that several are entirely substituted not only by more or less closely allied species of the same genus, but even by widely separated plants," and he asks the question "is it not probable that the reason for the demand for a restricted materia medica by certain physicians is due to the fact that some other drugs which have been employed formerly and whose therapeutic value would seem to have been established, are in some instances replaced and substituted by other plant-products, the therapeutic value of which not infrequently is unknown, and which in some cases are shown to be either very toxic or practically inert? We need only a few more instances of this replacement or substitution of drugs to call our attention to the need of directing our efforts so that the whole subject of collecting of drugs, as well as their commerce, will be under official control rendered effective by the organizations vitally interested in securing uniformity and efficiency of drugs." The paper gives a botanical description of *Rhus glabra*, *Rhus typhina* and *Rhus glabra borealis* with directions for differentiating the different species. His tests to determine the relative amounts of free acid in *Rhus glabra* and *Rhus typhina* demonstrated that the latter was superior in acid content to the former. The article is accompanied by an extensive bibliography of the subject.—Proc. N. J. Phar. Assn., 1913, 64-72. (E. C. M.)

## RHAMNACEAE.

**Cascara Sagrada.**—*Culture Experiments in the British Isles.*—W. J. Bean states that reports on germination of American seeds of *Rhamnus purshiana* distributed from Kew to about twenty establishments in the British Isles do not show that they possessed a high germinating power, the most successful results showing that not more than 35 per cent. were fertile. The best results, both as to germination and growth, were obtained by Mr. Collis Sandes at Tralee in Ireland, plants raised from 1908 seed being now 9 ft. high and 6 in. in girth of stem. The tree is also succeeding well in the Southwest of Scotland with Sir Herbert Maxwell and at the Edinburgh Botanic Garden. Sir Herbert's trees show that in favorable conditions berries may be borne on trees five or six years old. The plant seems to prefer a light soil, and there is little doubt of its hardiness. It is pointed out that at the present prices it scarcely seems likely that cascara sagrada would prove a

paying crop. The bark of the tree grown at Kew was difficult to peel; in fact, was scraped or cut off rather than peeled; but this was done in February, instead of during the period of greatest flow of the sap (May to June), as in America. The author suggests that as it is evident that the natural supplies must fail within a limited time, some method of utilizing one- or two-year-old shoots, leaving the tree as a whole uninjured, might simplify the problem of cultivation. *Chem. and Drugg.*, May 17, 1913, 752; from *Kew Bulletin*, 1913, No. 3, 123.

#### CELASTRACEAE.

**Catha Edulis.**—*Economic Use of the Leaves.*—The leaves of this shrub, which attains a height of up to 3 meters and which grows in Natal and Arabia, are used as a tea with a specially fine aroma. This tea has a stimulating effect and is even slightly intoxicating. It is used by the Arabs before commencing long journeys. The active principle of the drug is Katin,  $C_{10}H_{18}N_2O$ . The leaves contain about 0.12 per cent. of this alkaloid, which, however, is not identical with caffeine, but which possesses the same heart and muscle stimulating action. Katin, furthermore, is a nervine like cocaine without, however, possessing the analgesic or anæsthetic properties of the latter.—*Gehe's Handelsbericht*, 1913. (O. R.)

#### EUPHORBIACEAE.

**Caoutchouc and Gutta Percha.**—*Distinctive Character of Their Resins.*—Gustav Hillen has made a comprehensive investigation and study of the resins composing gutta percha, caoutchouc, and allied products, from which he concludes that the resins of gutta percha are more or less of a symmetric nature and uniformly contain phytosterins in large quantities. These phytosterins consist largely of lupeol,  $\alpha$ -amyrin and  $\beta$ -amyrin, and exist in the resins in ester-like combinations with cinnamic and acetic acids. A transition from these gutta percha resins to the caoutchouc resins is formed by the pseudo-caoutchoucs, such as 'pontianac,' "almeidina," and others, which also contain an abundance of phytosterin-like bodies. The real caoutchouc resins, which have not yet been thoroughly examined, show an entirely different composition. They are for the most part composed of smeary masses, difficult to separate, from which crystalline bodies are with difficulty obtainable. They are apparently composed in part of oxidation products of gutta percha, resinized volatile oils and resin; occasionally, however, here also phytosterins in small quantity

are found. *Phar. Ztg.*, lviii (1913), No. 64, 631; from Inaugural Diss., Bern.

**Caoutchoucs and Gutta Percha.**—*Nature of Resinous Constituents.*—Tschirch makes his 98th contribution to the investigations of the secretions, the practical work being done by G. H. Hillen.

**Pontianak Caoutchouc** (from *Dyera costulata* growing in Borneo) contains 65% water, 8 to 9% caoutchouc and the rest is resin. This resin consists of lupeol acetate,  $C_{31}H_{49}C_2H_3O_2$ ,  $\alpha$ - +  $\beta$ -amyrin acetate,  $C_{30}H_{49}C_2H_3O_2$ , and a residue.

**Lewa Caoutchouc** (from *Manihot-Glaziorii* growing in German East Africa) contains 7% of resin. This consists of isocholesterol acetate,  $C_{24}H_{39}C_2H_3O_2$ , a difficultly soluble green amorphous substance and a dark green balsamic mass.

**Guayule Caoutchouc** (from *Parthenium argentatum*) contains 16% resin. This is quite different in composition from the other caoutchouc resins, containing no phytosterins, but seems to be a resinified volatile oil.

**Malabuwai Gutta Percha** (from *Alstonia grandifolia* growing in the Metavi Islands) has a resin (yield not stated) which consists of  $\alpha$ - +  $\beta$ -amyrin acetate, an oily body and a trace of a yellow resene.

**New Guinea Gutta Percha** (from *Palaquium Gutta*) yielded 2.2% resin. This consisted of lupeol cinnamate, an oily body and a trace of yellow resene.

The paper contains all the analytical data leading to above conclusions and a table showing the color reactions of the resins from 18 different varieties of rubber.—*Arch. d. Pharm.*, 251 (1913), No. 2, 94. (H. V. A.)

**Rubber.**—*Description.*—In an article entitled "The Story of a Rubber Band," J. A. Sanford describes the botanical, chemical, geographical, mechanical and sociological relations of caoutchouc. Under the head of the chemical relations he speaks of the possibilities of a realization of synthetic rubber. He describes the collection and the preparation of rubber for the market and tells of the terrible cruelties and atrocities which accompany its collection. The article contains a strong appeal for 14,000,000 people engaged in rubber collection against the cruelties and oppressions

of the government of the Congo Free State, and that of the rubber districts of Peru.—Proc. Cal. Phar. Assn., 1913, 45-52. (E. C. M.)

**Castor Oil Plants.**—*New Disease in India.*—J. F. Dastur, of the Depart. of Agriculture in India, observes that though so widely distributed, the castor-oil plant has hitherto been regarded as immune from serious fungus pests, except the castor rust, but at Pusa the crop has been attacked by two serious pests. *Phytophthora parasitica*, n. sp., and a species of *Circospora*. The latter is not yet investigated, but the former destroys seedlings by causing "damping off," and also attacks leaves of older plants, and is the most injurious of the fungal parasites of castor. Brown leaf spots form the first external indication of the disease.—Pharm. Journ. and Pharmacist, August 9, 1913, 249; from Nature, July 17, 1913, 512.

**Castor Oil.**—*Methods of Administration.*—Castor oil is disagreeable to some persons largely because of its oily character, to others because of the disagreeable taste peculiar to it. When the stomach rejects castor oil it is often because of the taste left in the mouth, or because of the psychic impression which attends the taking of the dose. The simplest method of taking castor oil is to take some steps to prevent the oil from coating the mouth and then to swallow it quickly. Simple methods for this purpose are as follows: Prepare two warmed cups, one about half full and one about one-quarter full of a hot liquid, such as milk or coffee, and place the dose of oil on the surface of the smaller portion. Wet the mouth with the liquid from the half cup and then quickly drink all the contents of the other cup, finally drinking more from the first cup. Heating the mouth in this way prevents the oil from clinging to it except very slightly, and that little is promptly washed off. Care should be taken, of course, by sampling in advance to see that the fluid is about as hot as can be drunk quickly and yet not hot enough to burn. A more simple method can be used if it will suffice. Heat the oil and administer the dose in a tablespoon heated by being dipped in hot water. Then rinse the mouth with hot water, hot milk or other liquid.—J. Am. M. Assoc., v. 60, 1174. (M. I. W.)

**Euphorbia Pilulifera.**—*Chemical Examination.*—Dr. F. B. Power and H. Browning have subjected a quantity of the entire, freshly collected and air-dried plant of *Euphorbia pilulifera* to chemical examination, the material for this purpose being obtained from



the Fiji Islands. The air-dried plant, amounting to 20 kilograms, was ground, and completely extracted with hot alcohol, when, after the removal of the greater portion of the alcohol, about 4 kilograms of a viscid, dark green extract was obtained. This extract was then subjected to a complete chemical examination, with the following result:

The extract was first mixed with water and distilled in a current of steam, when it yielded a small amount of a pale yellow essential oil. From the portion of the extract which was soluble in water the following substances were isolated: (I) gallic acid; (II) quercetin,  $C_{15}H_{10}O_7$ ; (III) a new phenolic substance,  $C_{28}H_{18}O_{15}$ . The aqueous liquid contained, furthermore, a considerable quantity of amorphous, glucosidic material, together with a laevorotatory sugar from which *d*-phenylglucosazone was prepared. There were also indications of the presence of an exceedingly small amount of alkaloidal substance, but this did not permit of being further characterized.

The portion of the extract which was insoluble in water consisted of soft, resinous material, amounting to about 3.2 per cent. of the weight of the air-dried plant. From this material there were isolated: (I) triacontane,  $C_{30}H_{62}$ , with apparently a little ceryl alcohol,  $C_{27}H_{56}O$ ; (II) a new monohydric alcohol, *euphosterol*,  $C_{25}H_{39}OH$ , from which the *acetyl and bromoacetyl derivatives* were prepared. Euphosterol is evidently closely related to the compounds designated, respectively, as androsterol, homoandrosterol, taraxasterol, and homotaraxasterol, all of which appear to be members of a series of monohydric alcohols represented by the general formula  $C_nH_{2n-10}O$ ; (III) a phytosterol; (IV) a phytosterolin (phytosterol glucoside); (V) jambulol,  $C_{16}H_{34}O_4(OH)_3$ ; (VI) melissic acid,  $C_{30}H_{60}O_2$ , and a mixture of acids which appeared to consist chiefly of palmitic, oleic, and linolic acids.

Among the various constituents of *Euphorbia pilulifera* which have now been isolated and described there is none to which any specific physiological action can be attributed. Such therapeutic virtues as the plant has been presumed to possess would therefore not appear to depend upon any single substance of a definite chemical character. —Chem. and Drugg., April 12, 1913, 544.

**"Jambulol."**—*Identity with Ellagic Acid.*—In a paper entitled "Chemical Examination of Jambul Seeds" (in Year Book, 1912, 216), F. B. Power and Thomas Callan described a phenolic substance to which, being then regarded as a new compound, they assigned the name "jambulol." A substance evidently identical with this

had previously (1911) been isolated by Tutin and Clewer from Chinese Rhubarb, in minute quantities—too small for complete characterization, and subsequently (1913) Power and Browning isolated the same compound, in small amount, from *Euphorbia pilulifera* herb. The analysis of the above-mentioned substance, and of its well-crystallized acetyl and benzoyl derivatives, led to the conclusion that it was a pentahydric phenol, possessing the formula  $C_{16}H_3O_4(OH)_5$ , or, possibly, double this formula.

Quite recently one of the present authors (Callan) has had the opportunity of preparing a quantity of *ellagic acid* from myrobalans, when the observed similarity of the characters of this substance, to which the empirical formula  $C_{14}H_2O_4(OH)_4$  had been assigned, with those of the substance obtained from jambul seeds suggested their more complete comparison. This the authors have now accomplished. They find that the percentage composition of the two substances is so similar, and the respective tetra acetyl and penta acetyl derivatives agree so well, that the identical constitutional formula may be assigned to them; and that with consideration of the practical agreement in composition and characters, including recorded color tests, of the two substances designated, respectively, as “jambulol” and “ellagic acid,” no doubt can now be entertained respecting their identity.—Pharm. Journ. and Pharmacist, August 9, 1913, 245.

“**Haran-Tutuja.**”—*Botanical Source.*—David Hooper writes that the drug known as “Haran-Tutuja” has been referred by writers on Indian materia medica to a *Colchicum*, but that specimens recently received in the Indian Museum prove to be the knotty roots of *Euphorbia granulata*, Forsk.—Pharm. Journ. and Pharmacist, September 6, 1913, 369.

**Manketti Seed.**—*Precaution Regarding the Use of the Fixed Oil as a Food Product.*—H. Thoms has experimented with the object of determining the value of manketti oil as a food product. This oil is obtained from the seeds of the fruit of a *Euphorbiaceæ*,

**Ricinodendron Rautanenii**, Schinz.; and since the fixed oils from this family occasionally contain highly active components, it is inadvisable to accept it as being suitable as a food oil without careful toxicological experimentation. Regarding its physical constants, as determined by the author, manketti oil resembles poppy oil. Pharm. Ztg., lviii (1913), No. 13, 129; from Arb. a. d. Pharm. Inst. d. Univ. Berl.

## URTICACEAE.

**Ficus Glabrata.**—*Use of the Latex as an Anthelmintic.* The Columbia fig, *Ficus glabrata*, known as the "higueron," furnishes, when cut, an odorless, acid latex. The fruit, both raw and cooked, is used by the natives as a vermifuge for infants. Arango has found the fresh latex to be an effective remedy against ankylostomosis, and Robledo has employed it with success for tricho-cephalosis. The dose is 30 to 40 Gm. of the latex, given in two separate portions at an hour's interval, in milk. Afterwards a dose of castor oil is given. If possible, the patient should be kept on a milk diet during the cure. In eight days a coprological examination is made for the eggs of the parasite; if these are found, the treatment is repeated. L. P. Berrio has found this *Ficus* latex more reliable and effective than thymol as an anthelmintic against ascarides, strongyloid larvæ, tænia, and other intestinal parasites.—Pharm. Journ. and Pharmacist, September 27, 1913, 465; from Rev. Hygiène Med. trop., through Nouv. Remèdes, 30 (1913), 337.

## SALICINEAE.

**Salix Caprea.**—*Enzymes of the Leaves.*—According to J. Bolin the leaves of *Salix caprea* contain three ferments—salicase, which has a specific hydrolyzing action on salicin; amygdalase; and a third ferment which decomposes  $\beta$ -glucosides. These are not constantly present. The  $\beta$ -glucoside ferment was found in the leaves of 1911, but not in those gathered in 1912.—Apoth Ztg., xxviii (1913), 791; from Ztschr. Physiolog. Chem., 87 (1913), 182.

## CONIFERAE.

**Coniferous Trees.**—*Constants of Oils from Different Species.*—Helch has examined the oils distilled from a number of different coniferous trees and submits the following figures representing their constants:

Oil.	Sp. Gr.	Rotation.	Esters %.	Bromine Value.
1. <i>Pinus pumilio</i> .....	0.876	—18°	12.2	212
2. <i>Pinus pumilio</i> .....	0.860	—12°	5.7	242
3. <i>Pinus pumilio</i> .....	0.863	—16°	5.3	240
4. <i>Pinus pumilio</i> .....	0.871	—8°	7.2	242
5. <i>Pinus pumilio</i> .....	0.872	—6°	4.7	243
6. <i>Pinus pumilio</i> .....	0.876	—6°	10.5	235
7. <i>Pinus sylvestris</i> .....	0.882	—2°	7.2	240
8. <i>Pinus sylvestris</i> .....	0.875	+ 5°	6.3	255
9. <i>Abies excelsa</i> (cones) .....	0.863	—68°	6.9	238
10. <i>Abies excelsa</i> (leaves) .....	0.876	—44°	6.4	240
11. <i>Pinus sibirica</i> .....	0.912	—42°	30.3	110

Oil.	Sp. Gr.	Rotation.	Esters %.	Bromine Value.
12. <i>Pinus sibirica</i> .....	0.912	—45°	36.7	114
13. <i>Pinus sibirica</i> .....	0.913	—38°	37.0	122
14. Turpentine.....	0.867	—32°	3.0	263
15. Turpentine.....	0.870	— 3°	0.9	268
16. Turpentine.....	0.911	+11°	8.4	246
17. Turpentine.....	0.938	—27°	10.5	227

The author also states that the oil from *Pinus pumilio* should not yield more than about 10 per cent. distilling below 165°.—Chem. and Drugg., November 8, 1913, 715; from Pharm. Post, 1913, 838.

**Balsam of Fir.**—*Differentiating between the Canada and Oregon Balsams.*—J. G. Roberts and M. W. Becker state the differences between Canada and Oregon balsam of Fir as being: the Canada balsam is thicker than the Oregon, is not perfectly soluble in alcohol and solidifies when mixed with 20% magnesium oxide, to which tests the Oregon balsam does not respond. The Canada balsam dries, while the Oregon balsam remains sticky and therefore cannot be used in microscopy. The acid number of the Oregon balsam is usually higher than the acid number of the Canada balsam.—Proc. Penn. Phar. Assn., 1913, 328-331. (E. C. M.)

**Cedar of Lebanon.**—*Properties of the Resin.*—This product, rarely found in commerce, was furnished by Professor Schweinfurth of Cairo, to Dr. L. Reutter, who publishes the following report of its analysis: The 30 gram sample was found to consist of 6.5 grams of volatile oil, 7.5 grams of saponifiable material soluble in water, 10.32 grams of woody material, 0.98 gram of coloring matter, 3.5 grams of saponifiable material soluble in alcohol and ether, and 1.2 grams of mucilage and resene. Of these constituents, the oil was found to have a density of 0.8802 at 15°, a rotary power of —30° 36', and a refractive index of 1.4856. From the *saponifiable portion, soluble in water*, on pouring into acidulated water, there was obtained an orange-yellow powder partly soluble in ether and from the ethereal solution by evaporation was obtained a yellow-brown powder, having the formula  $C_{10}H_{16}O_2$ , which the author calls cedrinic acid. The *saponifiable portion, soluble in ether*, by treatment with diluted alkali and then precipitating by pouring the alkaline solution into acidulated water, gave a semi-liquid body having the formula  $C_{31}H_{36}O_5$ , which the author calls cedrinolic acid.

The commercial resin was almost insoluble in ether and sparingly soluble in alcohol, quite soluble in chloroform and insoluble



in cold potassium hydroxide solution. It melted between  $95.5^{\circ}$  and  $97^{\circ}$ , had negative acid numbers and a saponification number of 54.5 to 58.6.—Schweiz. Wschr. f. Chem. u. Pharm., 51 (1913), No. 32, 472. (H. V. A.)

**Pinus Bruttia.**—*Properties of the Resin.*—L. Reutter has examined this resin, obtained from Cairo, by the Tschirch method and finds that a 26.55 gram sample consisted of 3.5 grams of resin acids that could be extracted with ammonium carbonate; 8.5 grams of resin acids that could be extracted with sodium carbonate; 4.2 grams of volatile oil; 3.9 grams of resene; and 6.45 grams of woody tissue. It was soluble in acetone and alcohol, partly soluble in ether and chloroform, and sparingly soluble in oil of turpentine, benzol and petroleum ether. Its acid number is 122.5 to 126.5; saponification number 187 to 190; ester number 63.8 to 64.8. It melts at  $74^{\circ}$ – $75^{\circ}$  C. Its resin acids were obtained in too small an amount to permit of purification, while the volatile oil obtained was light yellow and of a terebinthinate odor.—Schweiz. Wschr. f. Chem. u. Pharm., 51 (1913), No. 33, 492. (H. V. A.)

**Pinus Sabiniana.**—*Crystalline Acid from the Oleoresin.*—O. A. Beath and Edward Kremers, in a note read at the Denver meeting of the Association, observe that the oleoresin of the "digger's pine" (*Pinus sabiniana*) is of interest, not only because of the heptane, which constitutes the bulk of the oil, but also because of the difficulties which the resin has offered in the study of the oleoresin. Thus far no crystalline resin acid had been obtained. Even fractional precipitation of the resin acids by means of the sparingly soluble lead salts and the decomposition of the lead salts by either hydrogen sulphide or sulphuric acid yielded no crystalline products. However, when hydrogen chloride was used to set free the acid from its lead salt a crystalline acid was obtained. This will be described later. For the present it may suffice to call attention to this modification in technique since it may be expected to yield results in other instances where the older methods have failed. It should be added that fractional distillation under diminished pressure yields not only a hard, clear resin such as has not been obtained previously from digger's pine, but a crystalline resin acid as well.—Journ. A. Ph. A., March, 1913, 303.

**Pine Needle Baths.**—*Curative Value.*—Spindler calls attention to the fact that in modern pine needle baths, preparations of the

needles are preferred to the needles themselves. He shows that such preparations are either aqueous extracts (largely worthless) or straight alcoholic solutions of the oils or such alcoholic solutions that have been emulsified (and therefore miscible with the bath water). He then gives an enthusiastic account of the curative value of such baths.—Schweiz. Wschr. f. Chem. u. Pharm., 51 (1913), No. 23, 338. (H. V. A.)

**Pseudotsuga Taxifolia.**—*Its Oleoresin Presumptively the So-called "Oregon Balsam."*—In a note presented at the meeting of the Association in Denver, O. A. Beath and Edward Kremers observe that it is a sad comment on American pharmacy that the question as to what is the botanical source of Oregon balsam should not yet have been solved. Thanks to the kind cooperation of the Forest Products Laboratory located at Madison and of the field men in the state of Oregon, another attempt at a distance has been made. Owing to a misunderstanding, the oleoresin supplied had been obtained by boring into the trunk of the trees rather than by collecting the oleoresin secreted in the pustules of the bark. While the results of the preliminary chemical study recorded in the paper do not solve the problem of Oregon balsam, they are of some slight phytochemical value. Continued cooperation having been promised by the Bureau of Forestry, this and other problems are to be taken up in the future.—Journ. A. Ph. A., March, 1913, 303.

## C—ANIMAL DRUGS AND PRODUCTS

**Cochineal.**—*Nature and Structure.*—Prof. Henry Kraemer contributes a very interesting and complete paper on this drug, with an exhaustive bibliography of the subject.—Proc. Penn. Phar. Assn., 1913, 237-256. (E. C. M.)

**Honey.**—*Detection of Technical Invert Sugar.*—Dr. F. M. Litterscheid recommends the following method for the detection of technical invert sugar, which, like Fiehe's resorcin-hydrochloric acid reaction depends on the formation of a coloring matter. It is carried out as follows: 10 to 20 Gm. of the honey are triturated with ether; the mixture is filtered, a small crystal of  $\beta$ -naphthol is added to the filtrate and the ether allowed to evaporate spontaneously. If then 4 or 5 Cc. of 90% sulphuric acid are added to the residue, a bordeaux-red to blue-violet color is developed in the course of half an hour in the presence of invert sugar.—Pharm. Ztg., lviii (1913), No. 31, 311; from Chem. Ztg., 1913, No. 32.

**Poisonous Honey from *Datura Stramonium*.**—A *Statement Based on False Information*.—In a paper read at the British Pharmaceutical Conference, 1913, Harold Dean speaks interestingly on the subject of the alleged poisonous properties of honey from *Datura stramonium*, exemplifying the devious paths by which statements get into books of reference and the difficulty of stopping the spread of false information once it has got a start. In the U. S. Dispensatory (19th edition, 1907, 773) occurs the statement "honey collected by bees from *Datura stramonium* is poisonous," and Tschirch in his "Handbook der Pharmakognosie" includes this plant in the list of plants that afford poisonous honey. As at the time these paragraphs were noticed there was a considerable area of *Datura stramonium* in bloom on the drug farms at Long Medford, in close proximity to several beehives, the matter seemed to the author worthy of attention. Inquiry showed that stramonium had been grown near the hives in previous years and that no complaints of the honey had arisen. On examining the plants no bees were found visiting the flowers. As the nectaries are at the bottom of the long corolla-tube it is evident that the flowers are adapted for pollination by night-flying insects with long proboscides, and not by bees. Having thus demonstrated to his own satisfaction that bees do not get poisonous or any other honey from *Datura stramonium*, the author traced up the source of error, the genesis of which should be consulted in the original paper, but may here be stated as follows: "In 1879, Mr. A. Biliotti, the British Consul at Trebizonde, called attention to poisonous honey, the poisonous properties of which he rashly guessed to be collected from *Datura stramonium*; but this statement was subsequently corrected, and *Azalea pontica* designated as the true source. The original statement got into a German pharmaceutical journal, from there to the "Dresden Beekeepers' Association," thence to another pharmaceutical journal, and thence to an American book of reference, and is still flourishing after more than 30 years.—Trans. Brit. Pharm. Conf. (Year-book of Pharmacy), 1913, 530-533.

**Russian Honey.**—*Properties*.—E. L. Sarin has examined 65 samples of genuine Russian honey, 5 samples produced by bees which had been fed with saccharose and 2 samples of "unripe" honey, and as a result of the examination, exhibited in form of several tables, arrives at the following conclusion: The water content of honey does not exceed 22%; the saccharose content of ripe honey not more than 5%. The determinations of invert



sugar, ash, acids and nitrogenous substances are of no practical value for detecting adulteration. Iron and manganese are normal constituents of honeys, the dark sorts (with the exception of conifera-honeys) having a high content of these metals, together with albuminoids and catalase.—Pharm. Ztg., lviii (1913), No. 21, 209; from Ztschr. f. Unters. d. Nahr. u. Genussm., 25 (1913), No. 3.

**Grecian Honey and Wax.**—*Distinctive Characters.*—The honey and wax produced in Greece have been subjected to comprehensive study by J. Emanuel, of Athens, the results of his observations and investigations justifying the conclusion that Grecian honey must be placed in the foremost rank of international honeys, not alone on account of its distinguished and well-recognized physical properties but also on the ground of its chemical composition. From the results of the chemical investigation of 16 waxes derived from the most productive regions of Greece, it is shown that Grecian wax fulfills all the requirements demanded in the literature for pure beeswax. While the limits of the constant numbers determined by the author do not correspond to those given by Benedikt, Hübl and Dieterich, they are well within the limits given by Ahrens and Helt. The comparative number was found greater and exceeds the accepted limits; but this is due to the purity and kind of wax itself and not to adulterants. The number is intended to represent the normal comparative number of Grecian waxes.—Pharm. Ztg., lviii (1913), No. 75, 749; from Ber. d. D. Pharm. Ges., 1913, No. 6.

**Silk and Its Substitutes.**—*Historical Review.*—Ekert gives an interesting review of the history of natural silk and of its substitutes, including mention of the medical applications of silk, of silk ash and of silk worm ash during the 16th and 17th centuries.—Schweiz. Wschr. f. Chem. u. Pharm., 51 (1913), No. 22, 317. (H. V. A.)

**Spermaceti.**—*The Commercial Product Not from a Single Species of Whale.*—In the monograph suggested by F. C. J. Bird and E. W. Lucas to be inserted in the forthcoming British Pharmacopœia as descriptive of spermaceti, it says of it: "A solid, fatty substance obtained from various species of whale." As is well known this product is usually regarded as being derived from a single species, namely, *Physeter macrocephalus*, and so, among other authorities, the British and the U. S. Pharmacopœias. It occurred to Mr.



William Kirkby to look through some references to the history of spermaceti, which had accumulated during a recent study on this article, and it must suffice here to say that he found abundant authoritative evidence in favor of the definition proposed by Bird and Lucas. He has credible information that both *Physeter macrocephalus* (the sperm whale) and *Hyperoödon rostratus* (the bottle-nosed whale) mainly produce the present supplies of spermaceti—the first mentioned largely preponderating; and that two other species of whale, the “pygmy sperm whale” (*Cogia breviceps*), probably yielding the Japanese spermaceti, and “Arnoux’s beaked whale” (*Berardius arnouxii*), which inhabits New Zealand waters, doubtless also contribute to the supply. It seems quite clear from the evidence quoted by Mr. Kirkby that the forthcoming B. P. should define spermaceti as being “obtained from *Physeter macrocephalus* and other species of whales.—Pharm. Journ. and Pharmacist, July 19, 1913, 68.

**Sponges.**—*Artificial.*—Philipp Roeder Bruno Rabe exhibited, in the third International Pharmaceutical Exposition in Vienna, artificial sponges which aroused great deal of interest. These artificial sponges can hardly be distinguished from the natural sponges, and are used extensively, having the advantage of great durability and cheapness.—Ph. Zhalle., 1913, No. 41. (O. R.)

**Thyroid Gland.**—*Factors Relating to its Pharmacy.*—Referring to Mr. Martin’s paper of 1912 (see Year Book, 1912, 470), R. Glode Guyer contributed a paper on some factors related to the pharmacy of the subject, which are derived from a long series of experiments tabulated in a series of voluminous tables, and which have led to some interesting deductions. The daily supply from the Edinburgh market was tabulated according to the number of lobes in each delivery, their moist weight when trimmed, and their weight after drying at 40° C., the results being shown in Table I. At the end of each month the dried glands were bulked together, freed from fat, and powdered—a sample of the month’s supply being set aside for further examination—the total number of lobes in each month, their weight, and their iodine content being shown in Table II; while supplementary tables (III and IV) record the individual weight of 100 lobes from one (special) delivery, and the weight of individual lobes trimmed, respectively.

The results show that there is a great variation in the weight of the glands, and that although the monthly average weight seems to increase steadily, the daily figures show this to be merely a

coincidence rather than a real factor. The B. P. C. gives the average weight of each gland as 4.5 Gm. (= 69.5 grains); Mr. Martin obtained an average of 22 grains, and the glands under consideration ranged from 10 to 62 grains in one consignment of 100, the average being 27.25 grains. As regards the ratio of the dried glandular substance to the moist, various standard authorities, such as the "Codex" and Squire, give 1 to 5, Mr. Martin gave 1 to 3.7, and the present author's results show a ratio of 1 dried to 3.6 moist glandular substance. This makes it important that the pharmacist, when dispensing thyroid gland on prescription, without further qualification, should employ *Thyroideum siccum*, B. P., as the substance to be used. Finally, Mr. Guyer expresses the opinion that too much stress is laid upon the vexed question of the iodine factor, as it is as yet an open question whether this does represent the therapeutic value of the drug. Moreover, as Mr. Martin observed last year, it is difficult to distinguish chemically between added iodine and the natural iodine. In short, it appears unwise to advocate a fixed factor for iodine content until certain points are conclusively decided, but the author thinks that the endeavor should be made to establish a factor for the ratio between the moist and the dried, fat-free, glandular substance, which factor, according to his experience, would not exceed 1 to 3.5.—Trans. Brit. Pharm. Conf. (Yearbook of Pharmacy), 1913, 478-487.

**Thyroideum Siccum.**—*Ratio of Moist to Dry Gland as a Standard.*  
—Referring to the articles on thyroid gland by N. H. Martin and by R. Glode Guyer (see preceding abstracts), Reginald R. Bennett mentions that at the British Pharmaceutical Conference in 1911, he read a paper on the same subject, entitled "A Suggested Standard for Thyroideum Siccum" (see Proceedings, 1911, 516), and now refers to the articles named with the object, not to discuss the iodine content of the thyroid gland, but rather to invite criticism upon the widely accepted statement that 1 part by weight of *Thyroideum siccum* represents 5 parts by weight of the fresh gland. This is approximately the ratio accepted in the U. S. P., and while the B. P. does not state the quantity of dry powder obtained by the official process of preparation, the same ratio (1 = 5) is mentioned in the "B. P. Codex" and in Squires' "Companion," as well as upon the label used for a well-known dry thyroid powder of American origin. In his own experiments he obtained figures which led him to suggest 1 = 4 as the probably correct ratio between the dry substance and the fresh gland, freed from fat and connective tissue as required by the B. P. Mr. Martin's recent

results, which are based upon much larger quantities of material (yielding over 18,000 Gm. of powder), showed an average of  $1 = 4.15$ ; while Mr. Guyer's figures obtained with a total product of 37 lbs.,  $14\frac{1}{2}$  oz. showed an average of  $1 = 3.75$ . Similar results are mentioned in Martindale's "Extra Pharmacopœia" and it seems therefore more nearly correct to accept a ratio of 1 to 4. Mr. Guyer remarks in his paper that a factor should be established for the ratio between the moist and the dried fat-free thyroid gland, and that this factor in his experience should not exceed 1 to 3.5. It may therefore well serve the purpose of establishing a standard on these lines, since it is as yet an open question whether the iodine content of the gland does actually represent the therapeutic value of the drug.—Pharm. Journ. and Pharmacist, November 29, 1913, 804.

**Thyroid Gland.**—*Restriction of Iodine Content.*—A recently reported study by Seidell and Fenger (Jour. Biol. Chem., 1913, xiii, 517) demonstrates that a continued restriction of the source of pharmacopœial thyroid to the thyroid glands of sheep would make practically impossible the production in the United States of a drug of 0.2 per cent. iodine content for all but a short period of the year. It is now evident that the maintenance of a standard of this sort will require the use of glands other than those of the sheep, and in addition, the mixing of the product obtained at the high and low seasons of the year.—J. Am. M. Assoc., v. 60, 1000–1001. (M. I. W.)

**Thyroid Gland.**—*Iodine Content.*—Supplementary to his previous paper on the iodine content of the thyroid gland (see Year Book, 1912, 470), N. H. Martin communicates in a paper read before the British Pharmaceutical Conference, 1913, a summary of the iodine content of thyroid gland for the various months in the year 1912–13. The number of lobes used was 13,927 against 6,560 in the previous table, the average weight of each fresh lobe being 1.30 grams, against 1.424 grams for 1911–12. The average iodine in the thyroideum siccum was 0.407, against 0.343 per cent., and in each fresh lobe 0.096 per cent., against 0.091, while the average iodine per lobe was 0.00123 gram, against 0.001296. These figures prove that in so far as an iodine standard for sheep's thyroids is concerned, a strength of 0.25% would not be difficult to maintain in the district from which the supplies were drawn.



Date, 1912.	No. of Lobes Used.	Weight of Fresh Lobes, Gm.	Average Weight of Dry Thyroid Obtained, Gm.	Average Weight of Each Fresh Lobe, Gm.	Average Yield of Dry Thyroid per Lobe, Gm.	Iodine in Dry Thyroid, %	Iodine on Fresh Weight, %	Average Iodine per Lobe, Gm.
July....	1,223	1,492	351	1.21	0.28	0.46	0.108	0.00131
Aug.....	1,944	2,400	449	1.23	0.23	0.47	0.088	0.00108
Sept.....	1,220	1,452	350	1.19	0.28	0.45	0.108	0.00128
Oct.....	1,318	1,429	292	1.08	0.22	0.51	0.104	0.00112
Nov.....	942	988	228	1.04	0.24	0.48	0.110	0.00114
Dec.....	564	695	152	1.23	0.26	0.45	0.098	0.00120
1913								
Jan.....	470	535	164	1.13	0.34	0.39	0.119	0.00134
Feb.....	1,172	1,488	348	1.26	0.29	0.38	0.088	0.00111
March...	1,032	1,638	381	1.58	0.86	0.37	0.086	0.00136
April....	1,584	2,505	739	1.58	0.46	0.28	0.082	0.00129
May.....	1,826	3,207	816	1.75	0.44	0.29	0.073	0.00128
June.....	632	836	224	1.32	0.35	0.36	0.096	0.00127
13,927		18,665	4,494	1.30	0.312	0.407	0.096	0.00123

Trans. Brit. Pharm. Conf. (Yearbook of Pharmacy), 1913, 487-488.

**Suprarenal Gland.**—*Sensitive Color Test for Adrenine.*—E. Moreschi describes the following color test for adrenine: A small quantity of tincture of iodine is cautiously floated on the surface of a liquid to be tested for adrenine. In presence of that substance a pink ring will be formed at the zone of contact. The color gradually spreads into the lower liquid, and in very dilute solutions disappears rapidly. On then adding a few Cc. of 1 : 1,000 aqueous solution of sodium persulphate a distinct reddish or violet color will reappear. This test will detect a dilution of 1 part of adrenine in 2 millions, and the color persists for several days. *Nouv. Remèdes*, 30 (1913), 427; from *Gaz. Med. Ital.*, 1913, 41.

**Adrenaline.**—*Colorimetric Determination in Desiccated Glands.*—A. Seidell describes a colorimetric method for the determination of adrenaline in desiccated glands, which is based on the use of commercial manganese dioxide as an oxidizing agent. The substance, 0.01 Gm., is thoroughly shaken with 0.005 Gm. of manganese dioxide and 10 Cc. of water, allowed to stand for an hour, filtered into a test tube, and the color compared with that of a color standard in another similar tube. The color standards are prepared from solutions of cobalt chloride [ $\text{CoCl}_2 \cdot 6\text{H}_2\text{O}$ ], 2 Gm., and 1 Cc. of concentrated hydrochloric acid per 100 Cc.] and of gold chloride (0.1 Gm. Au per 100 Cc.). The method gives somewhat higher



results than the phosphotungstic acid method. A table is provided showing the amount of adrenaline corresponding to the color standards.—Pharm. Journ. and Pharmacist, October 18, 1913, 573; from Journ. Biol. Chem., 15 (1913), 197.

**Adrenalin.**—*New Colorimetric Method of Determination.*—O. Folin, W. B. Cannon, and W. Denis have devised and describe a colorimetric method for the estimation of adrenalin. In this method suprarenal glands are digested with N/10 hydrochloric acid and water, and the mixture finally heated to boiling. Sodium acetate solution is added, the mixture boiled, diluted with water, and filtered or centrifuged to obtain a clear extract. The bulk of liquor thus obtained from 2 Gm. of gland may be about 100 Cc. Of this clear liquor 5 Cc. are placed in a 100 Cc. flask; in another similar flask 1 Cc. of fresh uric acid solution containing 1 Mgm. of the acid is placed. The following reagent is then made—100 Gm. of sodium tungstate and 80 Cc. of 85 per cent. phosphoric acid are boiled gently with 750 Gm. of water for nearly two hours, and then made up to 1 liter. Two Cc. of this reagent and 20 Cc. of saturated sodium carbonate solution are added to each of the 100 Cc. flasks, allowed to stand for a few minutes, shaken, and then filled up. The colors of the deep blue liquids are compared in a Duboseq colorimeter. The amount of adrenalin is calculated from the fact that it produces three times as much color as an equal weight of uric acid.—Pharm. Journ. and Pharmacist, May 3, 1913, 629; from Journ. Biolog. Chem., 13 (1913), 472.

**Pituitary Gland.**—*Liquid Preparation.*—The so-called *pituitary liquid* is a sterile solution containing the active principle of the posterior lobe of the pituitary body of the ox, free from preservatives. Each cubic centimeter represents 0.2 Gm. of the fresh posterior lobe of the pituitary body in physiologic salt solution. Pituitary liquid is made from the posterior lobes of the pituitary body of the ox by finely mincing the fresh glands and extracting with acidulated water. As the active principle is not destroyed by heat, the liquid is heated to boiling for the purpose of removing coagulable proteids and is then further purified by removing organic impurities such as peptones and other proteids. The clear colorless liquid is filled into one cubic centimeter ampuls and sterilized. J. Am. M. Assoc., v. 60, 1957. (M. I. W.)

**Hypophysis Extract.**—*Effects.*—J. R. Musser reports observations on the administration to 18 individuals of the dried extract of the whole pituitary gland without other medication. (Am. J.

Med. Sciences, 1913, v. 146, No. 2.)—J. Am. M. Assoc., 1913, v. 61, 805. (M. I. W.)

**Hypophysis Extracts.**—*Action on the Kidneys.*—R. von den Velden shows that extracts of the pituitary body depress kidney functioning. This effect warns of the necessity of caution with this form of organotherapy. It also explains the benefit from it in diabetes insipidus. (Berl. klin. Wschr., 1913, v. 50, No. 45.)—J. Am. M. Assoc., 1913, v. 61, 2278. (M. I. W.)

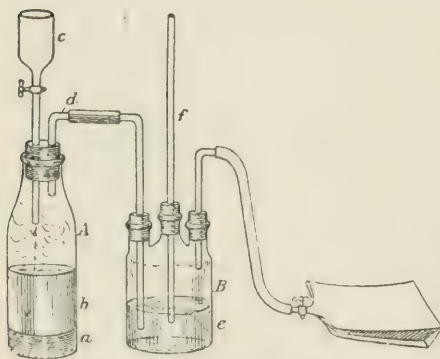
## INORGANIC CHEMISTRY

### NON-METALLIC ELEMENTS

#### OXYGEN.

**Oxygen.** *Preparation from Sodium Peroxide.*—R. van de Vorst describes a simple method and apparatus for preparing

FIG. 56.



Oxygen Apparatus.

oxygen for medicinal purposes by the decomposition of sodium peroxide with water, the reaction occurring according to the equation:  $\text{Na}_2\text{O}_2 + \text{H}_2\text{O} = 2\text{NaOH} + \text{O}$ . The apparatus, which is shown by Fig. 56, consists of a wide-mouth flask, A, surmounted by a glass cock dropping funnel, c, and a short tube, bent at right angle and joined at d to a tube leading into a three-

necked Woulfi bottle, B, containing water acidulated with sulphuric acid and serving as a wash bottle. This, in turn, is provided with a safety tube, f, and a delivery tube which is connected with a rubber gas bag. In use, a layer of sand, a, is placed into the flask, and on this the sodium peroxide b; whereupon, the connections being securely made, water is allowed to drop slowly into the flask, the inflow being regulated by the stop-cock of the funnel. Oxygen is at once generated, is washed by its passage through the acidulated water c, and collected in the rubber gas bag—about 200 Gm. of  $\text{Na}_2\text{O}_2$  being required to fill a 30-liter bag.—Pharm. Ztg., lviii

(1913), No. 34, 338; from *Journ. de Pharm. d'Anvers*, 1913, No. 6.

**Ozone.** *Its Bactericidal, Physiologic and Deodorizing Action.*

Jordon and Carlson report a comprehensive study on the bactericidal action of ozone, the effects of ozone on air bacteria, the influence of ozone in the inspired air on the heart and the blood-pressure in the dog, the influence of breathing ozone on the heart and the vasomotor mechanism in man, the cause of drowsiness, depression and coma following exposure to ozone, the influence of weak concentrations of ozone breathed for long periods and conclude that, in view of the evidence already in existence, the hygienic value of ozone in room ventilation would be hardly worth considering were it not for the persistent and sometimes extravagant claims made by the manufacturers and promoters of ozone generators. *J. Am. M. Assoc.*, 1913, v. 61, 1007-1012. (M. I. W.)

**Ozone Water.** *Preparation and Advantages over the Gaseous Form of Ozone.*—Otto Bürger has made comprehensive experiments regarding the solubility of ozone in water. The results show that aqueous solutions of ozone are obtainable without great difficulty if the water is faintly acidulated and contains no reducing substances, such as alcohol, for example. The presence of moisture in the air or in the oxygen has considerable influence on the yield of ozone, dry air yielding six times as much ozone as when it is moist, and the same ratio applies to the yield from oxygen. Furthermore, the author has investigated the question of sterilizing effects of ozone water and of gaseous ozone, respectively. His results point out that ozone water not alone exercises a powerful sterilizing effect, but is far preferable to gaseous ozone because of the simplicity of manipulation. Gaseous ozone may, however, as heretofore, be employed in ventilation operations. —*Pharm. Ztg.*, lviii (1913), No. 69, 688; from *Die Naturwissensch.*, 1913, No. 39.

**Ammonium Peroxide.** *Production and Characters.*—J. D'Ans and O. Wedig find that when a current of dry, pure ammonia gas is passed into a solution of pure hydrogen peroxide in absolute ether, kept cooled to about  $-10^{\circ}\text{C}$ ., handsome transparent crystals form after a short time. These have the constitution  $\text{NH}_4\text{O}_2\text{H}$ . If the gas be passed through the solution for a longer time an oily layer is formed, which freezes at about  $-40^{\circ}\text{C}$ . When the crystalline magma thus obtained is washed with cold ether in an apparatus cooled with a mixture of carbon dioxide, snow and ether, crystals are obtained which have the formula

( $\text{NH}_4)_2\text{O}_2$ .—Apoth. Ztg., xxviii (1913), 904; from Berichte, 46 (1913), 3075.

#### HYDROGEN.

**Pure Hydrogen Peroxide Solutions.**—*Preparation from the Commercial Product.*—According to L. Dupont, pure solutions of hydrogen peroxide may be prepared conveniently from industrial hydrogen peroxide by distillation, without loss of  $\text{H}_2\text{O}_2$ , if a sufficiently high temperature is secured by the addition of certain substances, such as phosphoric or sulphuric acid. The distillation is best conducted in a vacuum under 60–70 Mm. pressure, satisfactory results being obtained with the addition of 1 Kgm. of sulphuric acid to 1 liter of the hydrogen peroxide solution. The  $\text{H}_2\text{O}_2$  and water are vaporized in the original proportion, while readily volatilizable impurities are easily eliminated by fractional distillation.—Pharm. Ztg., lviii (1913), No. 82, 820; from Journ. de Pharm. d'Anvers, 1913, No. 17.

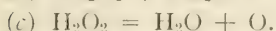
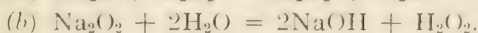
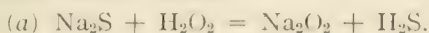
**Solid  $\text{H}_2\text{O}_2$  Preparations.**—*Modern Production.* Dr. A. Marcuse contributes a noteworthy paper in which he discusses the relations of solid and liquid  $\text{H}_2\text{O}_2$  preparations to each other, and describes various methods for the production of the solid forms, which have become possible by the discovery of the hydrogen peroxide carbamide preparations now available on the market.—Pharm. Ztg., lviii (1913), No. 94, 938.

**Hydrogen Peroxide.**—*New Reaction.*—O. von Sobbe calls attention to the following: Hydrogen peroxide with ammoniacal solution of silver nitrate produces a gray precipitate which is insoluble in salicylic acid. This reaction is still sensitive in a dilution of 3 drops of a 3% hydrogen peroxide in 100 Cc. of water.—Chem. Ztg., 1912, No. 98, 898. (O. R.)

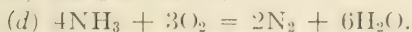
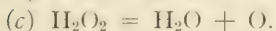
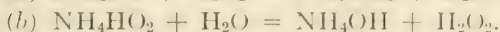
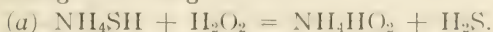
**Hydrogen Peroxide.**—*Action on Some Salts.* Sperber presents experimental work supporting his theory considering acids bases, and salts as "aequates" or "hyperaequates" (Schweiz. Wschr. f. Chem. u. Pharm., 1912, No. 50), showing that perhydrol (30%  $\text{H}_2\text{O}_2$ ) poured on solid sodium silicate precipitated silicic acid and formed sodium peroxide which later evolved oxygen; that boric acid was similarly liberated from borax; and that metaphosphoric acid, hydrogen ferrocyanide and hydrogen ferric cyanide were likewise liberated from their alkaline salts by treatment with perhydrol. Schweiz. Wschr. f. Chem. u. Pharm., 51 (1913), No. 12, 166. (H. V. A.)



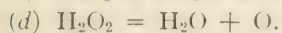
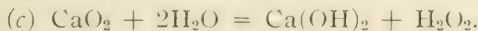
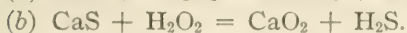
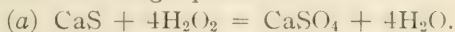
**Hydrogen Dioxide.**—*Replacement of Acids.*—Sperber reports further work strengthening his interesting theory that acids and bases are merely derivatives of the only two true acids, water and hydrogen dioxide (see Year Book, 1912, 260), this time citing the fact that hydrogen sulphide is given off when the sulphide of an alkali or of an alkaline earth is treated with 30% solution of hydrogen dioxide. After describing a special type of apparatus in which the operation could be conducted with safety and by means of which all of the generated gases could be isolated, he proceeds to show that the reaction in the case of sodium or potassium sulphide runs as follows:



With ammonium hydrosulphide the reaction is more complex, running something like this:



It was with considerable difficulty that the reaction between the sulphides of alkaline earth and hydrogen dioxide was studied, since very little hydrogen sulphide is given off, the action of the dioxide being chiefly that of oxidizing the sulphide to the sulphate, as shown in the following equations:



Schweiz. Wschr. f. Chem. u. Pharm., 51 (1913), No. 32, 469. (H. V. A.)

**Hydrogen Peroxide.**—*Action upon Glycerin.*—Effront distilled one part of solution of hydrogen peroxide, and ten parts of glycerin, whereby 99.8 per cent. of the glycerin was oxidized to formic acid. Ph. Zhalle., 1913, No. 36. (O. R.)

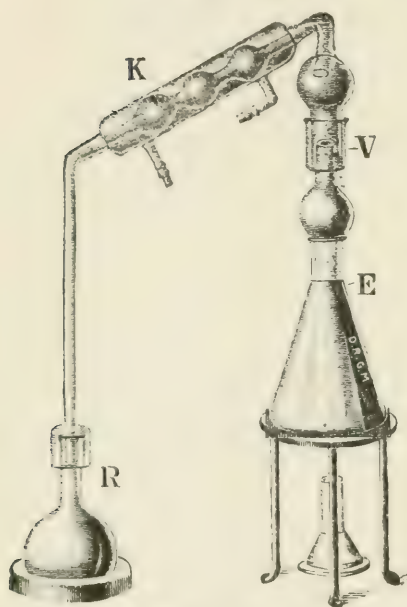
**Hydrogen Peroxide.**—*Germicidal Efficiency.*—P. G. Heinemann reports on the germicidal efficiency of commercial preparations of hydrogen peroxide. He points out that for practical application in rendering water and milk safe, hydrogen peroxide solutions can at best be considered only emergency measures. Expense, uncertainty of composition and its possible influence on organic

constituents and enzymes are complicating factors. The use of hydrogen peroxide solutions can be recommended only if pure solutions are available, but this procedure can never take the place of efficient water filtration or efficient pasteurization of milk.—*J. Am. M. Assoc.*, v. 60, 1603-1606. (M. I. W.)

**Distilled Water.**—*Apparatus for Securing Absolute Purity.*

I. Kurzmann has designed a new distillatory apparatus

FIG. 57.



Improved Still for Sterile Water.

for the preparation of absolutely pure distilled water, particularly for salvarsan injections, but equally serviceable for all kinds of medicinal, bacteriological and chemical purposes. The apparatus, which is shown by Fig. 57, is constructed completely of glass, without cork, rubber or ground-glass connections. The valve-cap *V*, although not ground or polished, fits snugly and closes the Erlenmeyer flask *E* perfectly, and the out-flow from the condenser *K* is completely protected by the cap or mantle covering the neck of the receiving flask *R*. The construction of the entire apparatus, which is easily taken apart, is very substan-

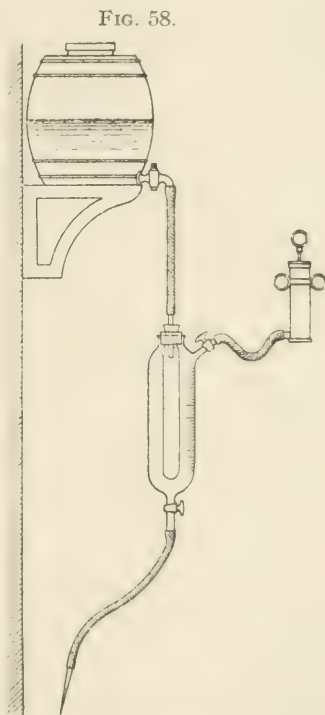
tial, requires no external support, and the manipulation is extremely simple. It is marketed by the firm of Aloys Schmidt, Breslau.—*Pharm. Ztg.*, lviii (1913), No. 58, 572.

**Germ-Free Distilled Water.**—*Preparation in Large Quantities.*

Dr. H. Schulze observes that water freshly distilled from glass, as is prescribed in the G. P. V for the preparation of physiological salt solution, is for various reasons not commendable. He finds that a perfectly germ-free water is obtained, free from all objections and in large quantities, if the steam from an ordinary still is allowed to escape for 5 or 10 minutes before connecting it with the condenser, and the distillate then collected in clean, sterilized flasks of one liter capacity, which are securely closed with cotton and steril-

ized in steam for an hour. Water so obtained retains its germ-free condition for 2 to 3 weeks unimpaired and has been used with perfect satisfaction for the preparation of salvarsan solutions, as well as for the preparation of physiological saline solution. Pharm. Ztg., lviii (1913), No. 41, 407.

**Sterile Distilled Water.**—*Apparatus for Constant Supply in Small Quantities.*—The preparation of sterilized water by filtration through porcelain filters, Berkefeld filters, etc., has recently been frequently recommended. An apparatus for preparing germ-free distilled water as well as solutions of medicinal substances in small quantities in this way has recently been described in "Les Nouveaux Remèdes" (1913, No. 9), by means of which the stock solution or water is drawn direct from the storage vessel into the porcelain filter, enclosed in a cylinder to which an air pump is attached. The cylinder is graduated so that filtration may be stopped when the desired quantity of liquid is obtained, whereupon the sterile liquid may be withdrawn in such quantities (into ampuls, etc.) as may be needed, the outflow being regulated by means of a glass cock, to which a rubber tube ending in a pipette point is attached. These several parts—reservoir, graduated cylinder enclosing the porcelain filter candle and the laterally attached filter-pump, are shown in the accompanying drawing (Fig. 58). Obviously, the several parts attached to the reservoir must be sterilized with boiling water before each operation.—Pharm. Ztg., lviii (1913), No. 50, 492.



New Water Still.

**Distilled Water.**—*Purification by Means of the Berkefeld Filter.*

Discussing the difficulties experienced in the preparation of distilled water intended for subcutaneous use, that is completely freed from bacteria, Dr. Knapp maintains that only freshly distilled water is suitable for this purpose. The removal of bacteria after

the water has been prepared a short time gives no guarantee, since the highly poisonous toxins quickly produced by metabolism, being soluble, cannot be removed by filtration, though the bacteria themselves are readily and completely removed by filtration through the Berkefeld filter. These filters are cylindrical discs (or candle-shaped masses) composed of highly porous infusorial earth which has been calcined and prepared by a special process and the author finds that if distilled water is passed through three of these filters successively, it becomes permanently and brilliantly clear, and a constant supply of 20 liters may be secured by a suitable arrangement of the apparatus, if the upper part of the apparatus is kept filled with water to be filtered. After several months, when the filtration begins to become slow, it is only necessary to remove the accumulation of bacteria by vigorously rubbing the filter discs, when filtration will go on with the original celerity. Without filtration through the Berkefeld filter, distilled water will rarely be obtained perfectly clear and will at best form a deposit on prolonged standing; whereas when filtered as suggested by the author it will retain its clarity if care is taken not to admit external impurities—this being readily accomplished by filtering the air admitted into the apparatus through cotton. Water purified in this way will answer all ordinary requirements, except for the preparation of hypodermic infusion, which should be made with freshly distilled and sterile water only. —Pharm. Ztg., lviii (1913), No. 30, 298.

**Distilled Water and the Berkefeld Filter.**—Knapp emphasizes the fact that ordinary distilled water should not be used in making salvarsan solutions and attributes much of the bad after effects of salvarsan injections to toxins, which develop as distilled water stands and which are not destroyed by sterilizing the water. Most distilled water is not absolutely crystal clear and in order to obtain it in this form, a Berkefeld filter is very useful. But it should be remembered that while such filter will remove the bacteria from a water sample, it will not remove the poisonous toxins which the bacteria have generated; so in salvarsan work, the Berkefeld filter will not replace the freshly distilled water recommended above.—Schweiz. Wschr. f. Chem. u. Pharm., 51 (1913), No. 4, 199. (H. V. A.)

**Distilled Water.** *Contamination with Copper.*—Carefully prepared distilled water, responding in all respects to the requirements of the G. P. V., was filtered by R. Schramm through a porcelain



filter cone (or candle) for the purpose of removing any microscopic germs that might be present. The water proving unsatisfactory for the intended purpose (intravenous injections), a large portion of it was filtered through cotton, which assumed a blue color, due, as subsequently determined, to the presence of copper in the form of bicarbonate, and evidently derived from the mineral composing the filter cone. The author directs attention to the value of filtration of distilled water through cotton for the detection of heavy metals, referring particularly to the investigations by Peyer (1912) of 25 samples of distilled waters obtained from different localities in Germany, of which only *four* proved to be absolutely free from metallic contaminants. Of the remaining 21 samples, 17 also responded to the requirements of the G. P. V; but when subjected to filtration through cotton it was found that Pb, Cu and Fe were contained in *one*, Pb and Fe in *five*, Pb and Cu in *two*, Cu and Fe in *three*, Pb in *one*, Cu in *two*, and Fe in *three* of the samples which had passed muster by the G. P. tests. The author, therefore, recommended that a more stringent test for the recognition of heavy metals in distilled water be introduced in the G. P., and regards as the simplest expedient filtration of the water through cotton, which permits the indubitable recognition of heavy metals after the passage of 5 liters through the pledget, and the complete removal of the same by several refiltrations.—Pharm. Ztg., lviii (1913), No. 22, 218; from Berl. klin. Wschr., 1913, No. 10.

**The Purity of Distilled Water.** Barladean discussed the importance of very pure distilled water not only in botanical work but also in some phases of pharmacy, notably in the preparation of solutions of salvarsan for intravenous injections. While ordinary distilled water suffices in most chemical operations, in plant cultures the presence of as little as one part of copper to a billion hinders the growth of certain plants. He cites numerous authorities showing this and reports some of his own experiments along this line. He then discusses the many methods of distillation suggested for making a pure distilled water pointing out that for determining the standard of purity beyond the limits of error of quantitative chemistry, no indication is better than the resistance offered by the water to the electric current. While Kohlrausch has prepared a water showing a conductivity of only  $0.7 \times 10^{-10}$  ordinary distilled water frequently shows a conductivity of  $3 \times 10^{-10}$  while the conductivity of the first portion distilled is sometimes as high as  $10 \times 10^{-10}$ . For botanical work, distilled water made in

a copper condenser is clearly out of the question and, while an all-glass apparatus is better for preparing water from the standpoint of plant culture, from the purely physical point of view such water is less pure than is that from a copper still. Thus a water distilled from an all-glass apparatus will show a conductivity many times greater than that distilled from a copper still, because of the alkaline salts dissolved from the glass. A tin condensing worm gives a water with a very low conductivity as does also a platinum condenser.

The paper discusses in detail the methods employed by a dozen investigators in trying to get an absolutely pure water. Of these, Barladean prefers the Brauner process, which requires repeated distillations—the middle distillate being employed for subsequent distillations—the successive distillates being treated with alkali, potassium permanganate and even standing exposed to the light for as long as six months. For details the reader is referred to the original paper.—*Schweiz. Wschr. f. Chem. u. Pharm.*, 51 (1913), Nos. 33, 34 and 35, 485, 497 and 513. (H. V. A.)

**Pure Distilled Water.**—*Biological Test.*—A. G. Barladean continues his study of perfectly pure distilled water, this time discussing the tests showing presence of copper and other heavy metals. Besides Kohlrausch's physical test—the electrical conductivity of the water—Barladean uses the biological test based on the growth of the fresh water alga of the *Spirogyra* species, which are killed if one part of copper to one billion is present and which are also exceedingly sensitive to other heavy metals. The paper gives minute directions for carrying out the test including collection and identification of the alga; keeping of a stock of it on hand; preparation of the test fluid made from the distilled water under examination and the control fluid prepared from pure spring water; and lastly the microscopic indications of the death of the plant. *Schweiz. Wschr. f. Chem. u. Pharm.*, 51 (1913), Nos. 45, 46 and 47, 679, 693 and 708. (H. V. A.)

**Impure Distilled Water in Pharmacy.**—A. G. Barladean continues the subject of the impurity of the average distilled water from the medical standpoint. His contention is that while the amount of metallic impurities present may not be discernible by ordinary chemical tests, the presence of these impurities constitute a serious menace when the water is injected intravenously. He lays great stress on the use of such water in preparing salvarsan injections, claiming that the reported untoward effects of such

injections may come from the impure distilled water. As to the bacterial content of the average distilled water he makes some startling statements claiming that many samples show more bacteria than the raw water of the Seine and the Spree. He asks whether such water used for washing wounds might not be the cause of infection. If such water is sterilized, the germs, it is true, will be killed, but he wonders whether the toxins from the bacteria do not still remain to exert untoward influence. In short, the paper is extremely pessimistic, nor is the gloom raised when he admits in closing that to make an absolutely pure water is an exceedingly difficult task.—Schweiz. Wschr. f. Chem. u. Pharm., 51 (1913), No. 45, 661. (H. V. A.)

**Water Supplies.** *Hypochlorite Treatment.* Although hypochlorite has been used as an emergency measure at Maidstone, England, 1897, the calcium hypochlorite treatment of water as a practical process dates from 1908, when it was used by Mr. G. A. Johnson of New York for water purification at the Chicago stock-yards. Previous attempts to purify the water of Bubbly Creek by a process of filtration in connection with the use of copper sulphate had been only partially successful. As the result of a lawsuit brought by the City of Chicago against the Union Stockyards Company, chlorinated lime (chloride of lime) was substituted for the copper sulphate by Mr. Johnson's advice. The amount of chlorinated lime used was 45 pounds per million gallons, and this treatment reduced the number of colon bacilli in the sewage-laden water of Bubbly Creek below the number found in the Chicago city water supply. Soon after the spectacular success of the Bubbly Creek experiments Mr. Johnson introduced the treatment for the water of the Boonton Reservoir at Jersey City and since then the method has been widely applied. J. Am. M. Assoc., v. 60, 1480. (M. I. W.)

**Water Supplies.** *Hypochlorite Treatment.* The evidence that continues to come to hand concerning the success of this procedure is still of a highly favorable character. It is unfortunate, however, that many of the published statements regarding the efficacy of the treatment do not state the amount of hypochlorite used, and in the case of typhoid statistics do not cover a sufficiently long period to afford an adequate basis for comparison; but these deficiencies are likely to be remedied in time. On the information now at hand, as presented by Jennings and others, there seems reason for much of the enthusiasm with which the

hypochlorite treatment is now being applied.—J. Am. M. Assoc., v. 60, 211-212. (M. I. W.)

**Water Supplies.**—*Bad Taste when Treated with Hypochlorites.*—There has been frequent and often bitter complaint about the taste of water treated with hypochlorite solution and while it is recognized that the danger from water-borne diseases is greatly reduced by the hypochlorite treatment, the necessity of having to bear the burden of daily complaint and to meet the indignant protests of thousands of aggrieved water drinkers, has no doubt been a factor in preventing the efficient use of hypochlorite. Lederer (Proceedings, 111. Water Supply Assn., 1913, 235) has confirmed the advantage of sodium thiosulphate for neutralizing the residual chlorine. J. Am. M. Assoc., 1913, v. 61, 1461. (M. I. W.)

**Water.**—*Purification by Large Cities.*—Rudolph Hering describes slow sand filtration, rapid mechanical filtration, coagulation with precipitation, and storage in large reservoirs, and disinfection by hypochlorites of lime and soda, by ozone and by ultraviolet rays, and concludes that the methods of water purification at present available give us the comfortable assurance that we have reached a stage of development in this branch of public service at which it becomes possible to furnish healthful water supplies at reasonable cost, whether they are obtained from subterranean or from surface source.—J. Am. M. Assoc., v. 60, 411-414. (M. I. W.)

**Fideris Spring Water.**—*Analysis.*—The water of this spring has been analyzed by Nussberger who finds it contains (in 10 liters) sodium, 3.02 Gm.; potassium, 0.19 Gm.; lithium, 0.0026 Gm.; ammonium, 0.027 Gm.; calcium, 2.91 Gm.; strontium, 0.041 Gm.; magnesium, 0.28 Gm.; iron, 0.016 Gm.; manganese, 0.0016 Gm.; aluminum, 0.0073 Gm.; chlorine, 0.04 Gm.;  $\text{SO}_4$ , 0.38 Gm.;  $\text{BO}_2$ , 0.0104 Gm.;  $\text{SiO}_2$ , 0.088 Gm.;  $\text{CO}_2$ , 8.95 Gm.;  $\text{NO}_3$  and  $\text{NO}_2$ , none. The paper gives minute details of methods followed in the analysis.

Schweiz. Wschr. f. Chem. u. Pharm., 51 (1913), Nos. 24 and 25, 349 and 365. (H. V. A.)

#### CHLORINE.

**Chlorine.**—*Determination in Natural Waters.*—According to the investigations of J. Tillmans and O. Heublein, the method of Mohr for the estimation of chlorine in natural waters, as heretofore described in the text books, yields in most cases inaccurate and



misleadingly high values. This is due to the prolonged titration and the use of insufficient indicator, whereby the precipitation of silver chromate and consequent color change of the liquid is retarded. The authors find that the method of Winkler, by the use of parallel experiments with diluted indicator and comparison solutions of different strengths, gives positive correction values, which have been proven reliable. They find, however, that this correction-method is not needed, if to 100 Cc. of the water under examination at least 1 Cc. of a 10 per cent. solution of potassium chromate is added, and the titration is continued until the first darkening of the liquid sets in. Pharm. Ztg., lviii (1913), No. 64, 630; from Chem. Ztg., 1913, No. 90.

**Hydrochloric Acid.**—*Industrial Removal of Arsenic and Other Impurities by Refrigeration.* G. A. LeRoy remarks that arsenic, probably the most objectionable impurity of commercial hydrochloric acid, is generally got rid of on an industrial scale in the form of insoluble sulphide. The process is not only tedious, but dirty and unhealthy. The process he now puts forward is a simple physical one, based on the use of artificial cold. The impure acid is placed in a convenient receptacle (e. g., a covered sandstone bowl with a capacity of 200 liters). The hydrochloric acid is gasified by the usual process, letting into the receptacle a small stream of concentrated sulphuric acid. The hydrochloric acid thus produced, which is tainted with arsenic chloride, is carefully dried first by passing through concentrated sulphuric acid and slightly cooled. The dry hydrochloric acid gas then arrives at a condenser filled with inert matter, such as coke, silex, or pumice stone, to furnish multiple contact points for the gaseous current. The condenser is then cooled to a temperature of  $40^{\circ}$  and under, by the circulation of brine or other readily controlled refrigerating means. The arsenic chloride is thus condensed, leaving the hydrochloric acid gas, which itself is not readily condensible. The arsenic chloride is drawn off through an opening in the lower part of the condenser. The hydrochloric acid gas, free from arsenic, and also from such other impurities as iron, selenium, sulphur dioxide, sulphur trioxide, etc., is then recovered by condensation in water by the usual methods. Pharm. Journ. and Pharmacist, November 15, 1913, 729; from Chem. Trade Journ., November 1, 1913, 435.

**Hypochlorites.** *Technical Estimation.* The following new method for the estimation of hypochlorites is suggested by H. G. Williams as being quite accurate enough for most purposes: The

hydrochlorite solution is titrated with a solution of hydrazine sulphate containing 3.2535 Gm. per liter (each Cc. = 0.0008 Gm. of oxygen = 0.003546 Gm. of chlorine), the end point being determined by iodide-starch paper as in the well-known arsenite method of Penot. If the alkali always present with hypochlorites is not sufficient to neutralize the sulphuric acid liberated, sufficient is added to ensure this; otherwise, the results are irregular. Sodium bicarbonate is the most suitable for the purpose, as it has little, if any, action on the liberated iodine. The action appears to be  $N_2H_4 + 2(MOCl) = N_2 + 2(H_2O) + 2(MCl)$ .—Chem. News, March 7, 1913, 109.

**Chlorinated Lime.**—*Commercial Quality.* A correspondent of the "Südd. Ap. Ztg.," states that while chlorinated lime offered on the market in bulk usually exceeds the strength (25%) prescribed by the G. P. V., that supplied in air-tight cartons is frequently of very inferior quality. This inferiority is not ascribable to the method of packing, which is usually very secure, but to the fact that the chlorinated lime is originally of inferior quality, some firms using for this purpose chlorinated lime containing barely 10 to 15% of available chlorine. Inasmuch as some brands of chlorinated lime in cartons are of excellent quality, however, this can and should be assured by the assay of a sample withdrawn from the package offered, under suitable precautions.—Pharm. Ztg., lviii (1913), No. 19, 190.

**Chlorates.**—*Improved Method of Assay.* After briefly describing six methods commonly in use for the assay of chlorates and mentioning certain faults inherent to them, Frank X. Moerk recommends the following method which has given satisfactory results and is free from the objections indicated, incidentally calling attention to the ratio between the chemical and the number of Cc. of a decinormal V. S., thus:

0.1 Gm.  $KClO_3$  (99.5%) requires 48.7 Cc.  $N/10 Na_2S_2O_3$  V. S.

0.1 Gm.  $NaClO_3$  (99.5%) requires 56.1 Cc.  $N/10 Na_2S_2O_3$  V. S.

Place 0.1 Gm. of the salt in a glass-stoppered bottle (150-200 Cc.), dissolve in 10 Cc. water, add 15 Cc. KBr sol. (10%) and 20 Cc. HCl (sp. gr. 1.20) and allow to stand forty minutes; after cooling the bottle and its contents by immersion in cold water, carefully rinse stopper, using 20 Cc. KI solution (10%) and titrate with decinormal  $Na_2S_2O_3$  V. S. (Results 99.5%, 99.73%, 99.85%  $KClO_3$ .) 1 Cc.  $N/10$  V. S. = 0.00204266 Gm.  $KClO_3$  or 0.0017743 Gm.  $NaClO_3$ . A blank test should be made to prove that the

combined reagents do not liberate iodine.—*Journ. A. Ph. A.*, February, 1913, 155-156.

**Potassium Chlorate.** *Test for Bromate.* The spontaneous explosion of fireworks containing potassium chlorate, has been traced to its content of potassium bromate. Chlorate preparations, made according to the old methods, are entirely free from bromates, but those manufactured by the electrolytic process, most generally contain bromates. According to the researches made in the German Army, the spontaneous combustions can be prevented if chlorates are employed which do not contain more than 0.1 per cent. of bromate, and the following test has been adopted: If 2 Gm. chlorate are dissolved in 100 Cc. of distilled water, and 5 Cc. of a 10 per cent. solution of potassium iodide are added, and the solution is acidulated with 4 Cc. of normal hydrochloric acid, then no coloration, or only a very faint blue coloration should appear within ten minutes.—*Ph. Zhalle.*, 1913, No. 42. (O. R.)

#### IODINE.

**Iodine.**—*Interesting Historical Review of Its Discovery, Sources, Compounds, Uses, and Pharmacology.*—In an elaborate monograph, Dr. Gordon Sharp traces the historical facts connected with the discovery, naming, natural distribution, compounds, uses, and pharmacology of iodine. While much of this is familiar, and available in the text-books and usual works of reference, this monograph furnishes a concrete statement of facts, particularly of those that have modernly developed, which, being distributed in the literature, are not conveniently accessible. A brief review of this interesting paper may therefore find place here, as follows:

The name iodine is derived from the Greek word "*iôdês*," meaning violet-colored, and it was so named because of the violet color of its vapor by Sir Humphry Davy, who, about 1813, first recognized its elementary character. The actual discoverer of iodine, however, was Bernard Courtois, a Parisian salt manufacturer, who, in 1811, while engaged in the manufacture of alkali from seaweed, happened to heat some mother liquor in a vessel contaminated with sulphuric acid. Observing an evolution of violet-colored vapors during this operation, he endeavored to trace the cause and eventually succeeded in isolating a crystalline body, which we now know as iodine. Mentioning this discovery to another chemist, Clement by name, this chemist made further experiments with the new substance, confirming Courtois' observations in a report laid before the Academy of Sciences (1813); but neither

of these chemists recognized that the new body was an element, which, as mentioned, remained for Davy to recognize and name: although having mentioned these facts to his contemporary, Gay-Lussac, his claims to priority in this respect were subsequently disputed because of his failure to anticipate the latter in their publication.

Iodine is so well known that it is almost unnecessary to describe it further than as being a non-metallic element occurring in bluish or grayish black plates, rhombs, or prisms possessing a pungent odor, imparting a beautiful violet color to chloroform or bisulphide of carbon solutions, and giving a blue color to cold starch paste.

It is widely distributed in nature. It is found associated, chiefly in the form of iodide, with silver and mercury in the Mexican mines, and with zinc, cadmium and lead, and is also found in the mother liquor from Chili saltpeter, in sea water as a magnesium and sodium iodide, and in appreciable quantities in the waters of many mineral springs, both in Great Britain and on the European continent; also in the salt rock of the Tyrol and in Switzerland, and in the turf of the latter.

In the vegetable kingdom iodine exists as an alkali constituent. As is well known it exists in large quantity in sea water *Algæ*, known as kelp, in which it was originally discovered, the *Laminaria* yielding the largest percentage of the element. In the animal kingdom, or associated with animal life, iodine exists in the *Spongia*, in coral (*Gorgonia carolini*), in *Sepia* (cuttle fish), and in certain insects of the *Julus* genus; but here, as opposed to the alkali combination of the vegetable kingdom, nearly the whole of the iodine is present in the form of intimate organic combination.

As to its manufacture, iodine was at one time made almost exclusively from kelp collected on the coast of Ireland and Scotland, where it grows profusely; but it is now also very largely manufactured from the mother liquors of Chili saltpeter, and within recent years from sea weeds growing off the coasts of Japan, both in its elemental state and as potassium iodide.

The inorganic salts and compounds of iodine, and a few of the organic iodine compounds, are too well known to require consideration here. It is of historic importance, however, to mention that

Iodoform, or triiodomethane, the analogue of chloroform, was discovered by George Simon Sernlas about the year 1828, and that later its chemistry, with which we are now familiar, was cleared up by Jean Baptiste Dumas, while in the meantime (about 1836)



Apollinaire Bouchardat introduced it into surgical practice, as a dressing for wounds.

As regards the pharmacology of iodine and its compounds, it needs only to be mentioned here that in its elemental state iodine is to-day almost exclusively employed externally, in the form of ointment, tincture, or strong alcoholic solution, as an application to enlarged glands, rheumatic joints, over adhesions or chronic effusions. The use of its salts for the treatment of syphylitic affections, and in all cases in which there is need for an agent which will aid or stimulate absorption—as in chronic rheumatic conditions, gout, hard goiters, lead and mercury poisoning, arterio-sclerosis, etc.—are also well understood, as is the fact that one of the serious drawbacks to the internal use of iodides resides in the unpleasant by-effects following their administration. To obviate these untoward effects, quite a large number of organic iodine compounds have modernly been introduced, such as compounds with proteins, tannins, fatty acids, and so on. These, the author says, may be called

**"Locked-up Iodides,"** for they are non-poisonous, and remain inert till they are acted upon by the ferments of the alimentary tract, where they are slowly broken up, and act as iodides. Some of the better known of these are:

**Iodostearin**, a di-iodide containing 47.5% of iodine;

**Lipoiodin**, an ethyl ester of the di-iodized unsaturated higher fatty acid—brassidinic acid—containing about 41% of iodine;

**Iodurase**, a compound of beer yeast with iodine;

**Iodone**, a combination of iodine and peptone;

**Iodolecithin**, a compound containing 28% of iodine;

**Iodoglidine**, a compound of iodine and the wheat protein glidine;

**Iodostem**, a preparation from grape juice in which the iodine is combined with tannin;

**Guajodol** is "paraiodoguaiacol;"

**Achijodin** is "monoiodovalerylglycolurea;"

**Iodoisovalerianicacidphenylester** is similar to the preceding;

**Iodanthrak**, an absorption product of iodine and animal charcoal;

**Iodipsol**, a compound of iodine and fatty acids;

**Iothion**, diiodoisopropylalcohol, containing about 80% of iodine.

The last named is used as an external application, which is easily absorbed and does not stain.—Pharm. Journ. and Pharmacist, July 26, 1913, 98-100.

**Iodine.** *Unusually Large Content in Some Mineral Springs in Java.*—It is stated in "Revue Scientifique" that iodine is now ob-

tained in some quantity from the waters of certain mineral springs in Java and other parts of the Dutch East Indies. It occurs in these waters chiefly as magnesium iodide, and is precipitated from them by means of copper sulphate. One Javan spring is said to yield as much as 12 Cgm. of iodine from each liter of water. The output of iodine from the Dutch East Indies amounts to about 30 tons per annum. It might be much more if more capital were employed in the undertaking.—Pharm. Journ. and Pharmacist, September 20, 1913, 437; from *Répertoire*, 25 (1913), 352.

**Iodides.**—*Delicate Reaction for Their Detection.*—According to the observation of R. Ciusa and A. Terni, the production of the reddish brown substance in testing for ammonia with the Nessler solution, may, with advantage, be used for the detection of iodides. The reagent is prepared by dissolving 10 Gm. of mercuric nitrate in 50 Cc. of water acidulated with 5 Cc. of nitric acid, and then adding 60 Cc. of concentrated ammonia solution. To the solution to be tested, 1 Cc. or more of the reagent is added. Chlorides give a white precipitate which does not interfere with the test. Bromides may give a white or yellow precipitate according to the concentration, but if the mixture of solution and reagent be heated, the yellowish or brownish red color due to iodide is developed. The reaction is more delicate than any hitherto devised for the purpose.—Pharm. Journ. and Pharmacist, September 13, 1913, 397; from *Gaz. Chim. Ital.*, 43 (1913), II, 86.

**Iodine.**—*Recovery from Iodometric Residues.*—H. W. Gill recommends the following expedient for the recovery of iodine from residues accumulating from iodometric titrations. Instead of employing volumetric solutions of potassium iodide, the corresponding solution of sodium iodide is used for the titration. It is then only necessary to evaporate the residues to dryness and after pulverizations extract them in a Soxhlet with absolute alcohol. The product is then recrystallized from alcohol and dried *in vacuo*.—Pharm. Ztg., lviii (1913), No. 84, 839; from the *Analyst*, 1913, 409.

#### FLUORINE.

**Fluorine.** *A Contaminant of Reagents.*—P. Carles mentions that fluorine is present in many reagents. He says that since hydrofluoric acid boils at under  $30^{\circ}\text{C}$ . and sulphuric acid at  $325^{\circ}\text{C}$ ., the pure sulphuric acid of commerce is generally free from fluorine. Should it not be so, by simply distilling off a small fraction, any fluorine present may be eliminated. Hydrochloric acid

is also generally free from fluorine, but nitric acid never is. Even some nitric acid specially prepared for the author as fluorine-free was found to contain considerable quantities of hydrofluoric acid. Potassium nitrate and sodium nitrate invariably contain fluoride, which cannot be removed by mere recrystallization. In order to obtain alkali nitrates free from fluorine, the solutions must be treated with barium nitrate, and then rendered alkaline with clear barium hydroxide solution. Excess of barium is then removed as carbonate, and as sulphate, and the precipitate filtered out through cellulose pulp. The filtrate is then evaporated and crystallized. From the pure alkali nitrate thus obtained, fluorine-free nitric acid can be prepared in the usual manner. Commercial caustic baryta always contains a large amount of fluorides, but these are insoluble. Therefore, if the barium hydroxide solution prepared therefrom is perfectly clear, it will be fluorine-free. Barium chloride is generally free from fluorine, but the acetate contains it; therefore, a reagent may be prepared with barium chloride and potassium acetate. This will be free from fluorine, since the barium salt will precipitate any fluoride in the acetate. Sodium bicarbonate is rarely free from fluorine, nor is potassium bicarbonate; ammonium carbonate invariably contains it. Glacial acetic acid is quite uncontaminated with fluorine. Many kinds of laboratory filter papers retain traces of fluoride. —Pharm. Journ. and Pharmacist, October 18, 1913, 573; from *Répertoire*, 25 (1915), 385.

**Sodium Fluoride.**—The following articles deal with sodium fluoride:

Loevenhart and Peirce: The inhibiting Active Effect of Sodium Fluoride on the Action of Lipase, *Jour. Biol. Chem.*, 1907, II, 397.

Amberg, S. and Loevenhart, A. S.: Further observations on the inhibiting Effect of Fluorides on the Action of Lipase, Together with a Method of the Detection of Fluorides in Food Products, *Jour. Biol. Chem.*, 1908, iv, 149.

Brandl and Tappeiner: Ueber die Ablagerung der Fluorverbindungen im Organismus nach Fütterung mit Fluornatrium, *Ztschr. f. Biol.*, 1891–1892, N. F., x, 518.

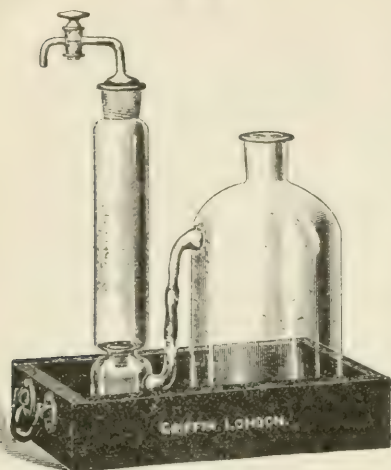
Waddell, L. A.: The Physiologic and Medicinal Action of Hydrofluoric Acid and the Fluorides, *Indian Med. Gaz.*, 1883, xviii, 97, 126, 183, 217, 248, 284, 312, 337. *J. Am. M. Assoc.*, v. 60, 1381. (M. I. W.)

#### SULPHUR.

**Hydrogen Sulphide.**—A *New Generator*.—F. Southerden directs attention to the new and compact hydrogen sulphide generator

for general laboratory purposes, shown by Fig. 59. It consists of a reaction tower and acid reservoir, connected by a stout rubber union as shown, the lower part of the tower being separated by

FIG. 59.



Hydrogen Sulphide Generator.

a radially grooved plug and constituting a drainage chamber. The mode of action is apparent from the figure. Among other advantages claimed, the apparatus, except for the rubber union, is made wholly of glass, while for ordinary qualitative analysis the gas requires no washing, since the upper part of the tower, owing to its height, serves to arrest spray produced below; moreover, the dense stale liquor tends to sink in the reservoir as fast as produced, relatively fresh acid being available on re-starting. A charge consists

of about 2 lbs. of iron sulphide and half a gallon of a mixture of commercial hydrochloric acid and water in equal volumes. The apparatus is manufactured by the firm of J. J. Griffin & Sons, London.—Chem. News, February 21, 1913, 86.

**Sodium Thiosulphate Solutions.**—*Apparent Stability.*—In a communication to the British Pharmaceutical Conference, 1913, C. H. Hampshire and W. R. Pratt call attention to the apparent stability of sodium thiosulphate V. S. Having found it necessary to make titrations with this volumetric solution at regular intervals, and in accordance with custom standardizing the solution each time before use, they were surprised to notice that the decinormal strength of the standard solution remained unaltered for many weeks, even where exposed to daylight in bottles of white glass. Solution of sodium thiosulphite is generally considered to be quite unstable, as is shown by quotations from numerous accepted authorities, and it therefore seemed of interest to make an experimental inquiry into the cause of the apparent stability of the solution in the hands of the authors. The results of their investigation of solutions prepared from pure recrystallized salt, from ordinary crystallized salt, and from ordinary photographic "hypo," kept under varying conditions, as to containers, exposure to



light, in the dark, etc., speak for the stability of these solutions, which were examined and checked from time to time. The solutions made from the pure recrystallized salt had retained their titer unchanged after a period of eight months. No change took place in the titer of the solutions made with the ordinary salt after keeping for nearly four months, and none was observed in the "hypo" solutions at the end of four weeks. The only change, which proved to be negligible, was the deposition of minute crystals of sulphur in the first mentioned solutions. Trans. Brit. Pharm. Conf. (Yearbook of Pharmacy), 1913, 561-564.

**Sodium Hydrosulphite.**—The Badische Anilin und Soda Fabrik market this salt, which has the chemical composition of  $\text{Na}_2\text{S}_2\text{O}_4$ . It is to be used for bleaching or decolorizing foods, wine, molasses, etc. A. Bonis finds that this salt has no advantages over the bisulphites of the alkalies. —Ann. Falsifications, 5, 1912, 378. (O. R.)

**Sulphur Dioxide.**—*Poisoning Effect by Its Fumes.*—Sulphur dioxide is said to give an acid reaction to the blood. The hemoglobin is changed first through the loss of oxygen and then by decomposition to hematin, as with mineral acids. The respiratory tract has a catarrhal or even croupous aspect, due to the action of the acids. The lungs are partly edematous. Sulphur dioxide is an active reducing agent, and in the processes becomes oxidized to form sulphuric acid. The breathing of small quantities of sulphur dioxide does not seem to produce any serious effects. It is stated that from 1 to 3 per cent. can be respired without ill effects. Both men and animals may be habituated to its inhalation. J. Am. M. Assoc., v. 60, 1246. (M. I. W.)

**Sulphuric Acid.**—*Titration in Presence of Copper Sulphate.*—For the analysis of electrolytic copper baths Wogrinz and Kittel have described the following method: The total sulphuric acid, free and combined, is found by precipitating the copper with hydrogen sulphide, filtering and titrating with alkali, using methyl orange as indicator. The free acid is then titrated in a separate portion, using Congo-red paper as indicator. A. Wogrinz, however, now finds that Congo-red is not satisfactory, and states that methyl orange may be used instead with advantage. The acid copper solution gives with methyl orange a reddish violet color, which changes to greenish yellow on neutralization. Sufficient of the indicator must be added to give a reddish violet color, free from the green tint of copper, and the flask must be well shaken towards the end of the titration to prevent precipitation of copper hydroxide.

—Pharm. Journ. and Pharmacist, October 11, 1913, 533; from Chem. Ztg., 86, 1913, 869.

**Sulphuric, Nitric, and Nitrous Acids.**—*Determination in Admixture.*—G. Finch recommends the following method for the determination of sulphuric, nitric and nitrous acid in admixture: First, the total acidity is estimated by titration with  $N/10$  barium hydroxide, phenolphthalein being the indicator, and cellulose fiber having been previously added to help subsequent filtration. After heating a short time to boiling, the barium sulphate is filtered off and washed until the water fails to cause cloudiness in dilute sulphuric acid. The removal of the sulphate is necessary, as it reacts with potassium chromate, used in the next stage. The filtrate containing the nitric and nitrous acids is titrated with  $N/5$  solution of the chromate when boiling. This solution must be free from carbon dioxide and be neutral. If weakly alkaline, the fixing of the end point is difficult. The chromate solution must be run slowly into the boiling filtrate otherwise the barium chromate takes long to precipitate. The reactions are:  $\text{H}_2\text{SO}_4 + 2\text{HNO}_3 + 2\text{SO}_2 \cdot \text{OH} \cdot \text{ONO} + 5\text{Ba}(\text{OH})_2 = 3\text{BaSO}_4 + \text{Ba}(\text{NO}_3)_2 + \text{Ba}(\text{NO}_2)_2 + 8\text{H}_2\text{O}$ .  $\text{Ba}(\text{NO}_3)_2 + \text{Ba}(\text{NO}_2)_2 + \text{K}_2\text{CrO}_4 = 2\text{BaCrO}_4 + 2\text{KNO}_3 + 2\text{KNO}_2$ . Next, the nitrous acid is determined in the original mixture of acids by titration with  $N/20$  potassium permanganate, the solution being acid and warm ( $40^\circ \text{C}.$ ). This reaction is as follows:  $2\text{KMnO}_4 + 5\text{HNO}_2 + 3\text{H}_2\text{SO}_4 = \text{K}_2\text{SO}_4 + 2\text{MnSO}_4 + 5\text{HNO}_3 + 3\text{H}_2\text{O}$ .—Pharm. Journ. and Pharmacist, April 5, 1913, 469; from Chem. Eng. and Works Chem., 1913, 38.

**Sulphates.**—*Distinctive Micro-Reaction.*—G. Denigès describes the following distinctive micro-reaction for the presence of sulphates: A reagent is prepared by dissolving 10 Gm. of commercial mercurous nitrate in a mixture of 100 Cc. of water, and 10 Cc. of pure nitric acid. This solution is quite stable if kept in yellow-black bottles with a globule of metallic mercury. A drop of the solution to be tested for sulphuric acid, either free or as sulphate, is placed on a micro-slide, and a drop of the reagent placed in the middle thereof by means of a pointed rod. The cover is placed in position after allowing about a minute for diffusion, and the mixture is examined under a low power. Characteristic crystals of mercurous sulphate will be seen if any sulphuric acid or soluble sulphate is present. A concentration of 1 : 50 is most convenient for the solution to be tested. Pharm. Journ. and Pharmacist,

December 20, 1913, 911; from Bull. Soc. Pharm. Bordeaux, 53 (1913), 425.

**Sulphates.**—*Laxative Action.*—In explanation of the laxative action of sulphates, a writer in the "Journal of the American Medical Association" observes that, broadly speaking, the drugs known as laxatives or purgatives may be considered to behave in one of two ways: either they promote the motor functions of the bowel, and as the result of the heightened peristalsis cause the normally fluid contents of the intestine to be propelled to the rectum before the usual degree of concentration by absorption of water has taken place; or by some mechanism or other they permit a dilution of the intestinal contents whereby the latter remain more or less liquid or voluminous. In either case the end effect is the same; for an undue accumulation of fluid masses in the intestine, whatever their origin may be, tends to bring about a vigorous reflex peristalsis whereby the bowel becomes emptied.—J. Am. M. Assoc., v. 60, 1706-1707. (M. I. W.)

#### NITROGEN.

**Nitrogen.**—*Clinical Method of Its Total Estimation.*—Jacob Rosenbloom outlines several simple titration methods for the estimation of the total nitrogen and ammonia nitrogen of urine which depend on the fact that when a neutral solution of an ammonium salt is treated with formaldehyde, combination occurs with the formation of hexamethylenetetramine and the liberation of a corresponding amount of acid which can be titrated with tenth-normal sodium hydroxide. The reaction is as follows:  $4\text{NH}_4\text{Cl} + 6\text{H}\cdot\text{CHO} + 4\text{NaOH} = (\text{CH}_2)_6\text{N}_4 + 10\text{H}_2\text{O} + 4\text{NaCl}$ . J. Am. M. Assoc., 1913, v. 61, 87-88. (M. I. W.)

**Nitrous Oxide.**—*Anæsthetic Action.*—Harry G. Sloan compares nitrous oxide anæsthesia and concludes that, while technically nitrous oxide anæsthesia is more difficult for the surgeon, he is amply repaid in sacrificing his convenience for the best interest of the patient, because patients have returned to their work in progressively better condition, the mortality from operations has progressively decreased and the comfort of the patient at large has become a marked feature. J. Am. M. Assoc., 1913, v. 61, 838-839. (M. I. W.)

**Nitrous Acid.** *Determination in Water Containing a Ferric Salt.* P. Artmann recommends the following method of determining nitrous acid in water containing ferric salts: To 100 Cc. of

the water 8.0 Gm. of the purest sodium phosphate, followed by 0.2 Gm. of potassium iodide, are added and the mixture is shaken until the phosphate is dissolved and only a whitish turbidity of ferric phosphate remains. The liquid is then acidified with 5 Cc. of 4 *N* sulphuric acid and 2 Cc. of starch solution are added. In the presence of 0.3 Mgm. of  $N_2O_3$ , an immediate blue color is developed. In this way 0.1-0.2 Mgm. of  $N_2O_3$  may be detected in water containing up to 500 Mgm. of ferric salt in a liter.—Pharm. Ztg., lviii (1913), No. 40, 397; from Chem. Ztg., 1913, No. 49.

**Nitric Acid.**—*Qualitative Determination in Presence of Nitrous Acid.*—W. N. Iwanow describes a new method for the qualitative determination of nitric acid in the presence of nitrous acid. He uses as reagent a solution of quadrivalent iridium in sulphuric acid, which is prepared by treating 0.025 Gm. of iridium in form of  $IrO_2$  or  $(NH_4)_2IrCl_6$  with 4 to 5 Cc. of water, adding 100 Cc. of conc. sulphuric acid and heating the mixture until it becomes colorless. The substance to be examined is added in the solid state and completely dried to 5 Cc. of this reagent, which is previously heated, whereupon if nitric acid is present a blue color is developed, but soon disappears if the quantity is very small. The reaction is best carried out in an atmosphere of carbonic acid in a suitable apparatus through which the gas is caused to flow.—Pharm. Ztg., lviii (1913), No. 21, 209; from Chem. Ztg., 1913, No. 16.

**Nitric Acid.**—*Detection in Watered Fruit Juices.*—A considerable time ago, Dr. R. Cohen described a new method for the detection of nitric acid in watered fruit juices, which is carried out by extracting the nitric acid from the evaporated fruit juice, rendered alkaline, and determining its presence with diphenylamine. This method has since been criticized by Tillmanns and Splittgarber, after experimental investigation, and pronounced by them as being insufficiently sensitive. Dr. Cohen in a recent rejoinder, however, maintains that his method does not lack in sensitiveness, and shows that it is quite possible to detect as little as 2 Mgm. of  $N_2O_5$  in a liter of raspberry juice. Moreover, Dr. Cohen contends that extreme sensitiveness is not commendable, since nitric acid occurs in minute quantities also as a natural constituent of unwatered fruit juices.—Pharm. Ztg., lviii (1913), No. 56, 552; from Ztschr. f. öffent. Chem., xix (1913), No. 12.

**Nitric Acid.**—*Detection of Very Small Quantities in Water.*—S. Rothenfusser recommends a reagent consisting of diphenylamin,



glacial acetic acid and hydrochloric acid for the detection of very small quantities of nitric acid in water. To 20 Cc. of concentrated sulphuric acid (free from nitric acid) one drop of his reagent (*not more*) is added, shaken, and 10 Cc. of the water is immediately added and again shaken. A diffuse blue coloration is produced which, even with 1 to 2 Mgm.  $N_2O_5$ , in a short time becomes very intense, and even smaller quantities may be recognized. The reaction can also be carried out as follows: 1 Cc. of a solution of 1.0 Gm. diphenylamin in 100 Cc. of purest  $H_2SO_4$  is placed in a graduated glass-stoppered cylinder, 1 drop of hydrochloric acid (sp. gr. 1.19) is added, and sufficient of the purest sulphuric acid is then added to make 100 Cc. Of this solution, which contains 0.01 per cent. of diphenylamin, 20 Cc. are then mixed with 10 Cc. of the water under examination, or the water is simply superimposed upon the acid reagent, whereupon a blue zone soon develops at the point of contact and gradually increases in intensity. —Pharm. Ztg., lviii (1913), No. 64, 630; from Chem. Ztg., 1913, No. 89.

**Chili Saltpeter.**—*Blue Coloration.*—Dr. Hundehagen claims that the blue color which sometimes occurs in Chili saltpeter is due to an alga. However, it is more probable that this blue color is due to the formation of a starch iodide, as flour is used in the process of clarification of Chili saltpeter.—Ztschr. f. öffent. Chem., 1913, 72. (O. R.)

**Air.**—*Alleged Purification by the Ozone Machine.*—According to Sawyer, Beckwith and Skolfield, the experiments of a number of careful investigators have discredited the claims made for ozone as a purifier of air. The authors review some of the available literature on the use of ozone, report a number of experiments made by themselves, and conclude that the gaseous products of the two well-known ozone machines examined are irritating to the respiratory tract and, in considerable concentration, they will produce œdema of the lungs and death in guinea pigs. The ozone machines produce gases which mask disagreeable odors of moderate strength and in this way the machines can be made to conceal faults in ventilation while not correcting them. J. Am. M. Assoc., 1913, v. 61, 1013–1015. (M. I. W.)

## PHOSPHORUS.

**Phosphorus.**—*Detection in the Elemental State.*—Introducing an account of the detection of elemental phosphorus in a human

cadaver exhumed nearly a month after burial, Dr. Karl Alpers mentions that comparatively few observations concerning the rapidity of its oxidation, and consequent destruction of its elemental state, are available in the literature. According to the researches of Nattermann and Hilger on the detection of phosphorus in forensic chemical examinations, published in 1897, it appears that the oxidation of the phosphorus is effected when in admixture with organic substances by the atmospheric oxygen, but that this effect may be retarded under various conditions, particularly by the putrescence of the material, so that the oxidation is greatly diminished or entirely prevented. In a case mentioned, 0.003 Gm. of phosphorus in admixture with putrefying organic matter was determinable after six months; while, on the other hand, Th. Poleck (1887) failed to find a trace of elemental phosphorus in a cadaver three months after death. In the present case, Dr. Alpers found considerable quantities of elemental phosphorus, notwithstanding that the contents of the stomach had almost completely disappeared, and only a very small quantity of pasty substance (several grams) was available in the intestine, very little of this sufficing for the qualitative determination of elemental phosphorus. —Pharm. Ztg., lviii (1913), No. 13, 127.

**Elemental Phosphorus.**—*Influence of Atmospheric Oxygen on Its Determination.*—Referring to the preceding paper of Dr. K. Alpers, A. Heiduschka communicates the results of the chemical examination of the stomachs of two geese which had been submitted for analysis in the case of a damage suit for presumptive poisoning of these and other fowls. One of the geese was delivered entire; of the second only the stomach simply enwrapped in some paper—the animals having died six weeks before delivery. The examination of the stomach and intestines of the whole goose revealed the presence of elemental phosphorus, which was determined both qualitatively and quantitatively; but in the stomach which had been received unwrapped in paper and had consequently been freely exposed to the action of atmospheric oxygen, during 6 weeks, not a trace of elemental phosphorus could be detected—nor could any other poison be detected by the usual methods of examination. —Pharm. Ztg., lviii (1913), No. 18, 176.

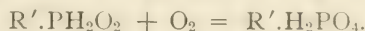
**Phosphorus Matches.**—The Hughes-Esch bill, by excessive taxation, will legislate the poisonous white phosphorus match out of existence in this country. The effect of this federal measure will be that no white phosphorus matches will be manufactured

in the United States after June 30, 1913. A substitute, sesquisulphide of phosphorus, which is compounded from the non-poisonous red amorphous phosphorus, will take the place of the poisonous white or yellow phosphorus as a prime combustible in the manufacture of matches. —J. Am. M. Assoc., v. 60, 850. (M. I. W.)

**Hypophosphites.**—*Assay with Potassium Dichromate.* In a paper read before the British Pharmaceutical Conference, 1913, T. Tusting Cocking and James T. Kettel point out the advantage of potassium dichromate as an oxidizing agent for the assay of hypophosphites, and propose a method which gives results, both concordant and accurate when checked by the gravimetric method of Jowett and the bromine method of Rupp and Kroll, but far less tedious than either of these. The working details of the new method are as follows:

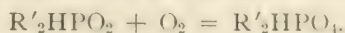
2.5 Gm. of the salt under examination are dissolved in 40 Cc. of water and an excess of lead acetate solution (10 per cent.) added to precipitate phosphites (5 Cc. is usually sufficient), and the solution is made up to 50 Cc., well shaken, and allowed to stand until the supernatant liquid is quite clear (usually about one hour); 10 Cc., representing 0.5 Gm. of the salt, are carefully pipetted off, 50 Cc. of normal potassium bichromate solution and 10 Cc. of sulphuric acid added, and the mixture heated on the water bath. At the end of an hour the solution is cooled and diluted to 250 Cc. with water. The excess of dichromate is then determined in 50 Cc. of this solution by titration with decinormal sodium thiosulphate solution, after addition of potassium iodide.

The hypophosphorous radicle is completely oxidized to phosphate by absorbing two atoms of oxygen according to the equation:



The error due to the bulk of the lead precipitate is negligible, this not occupying more than 0.05 per cent. of the volume of the liquid.

Phosphites are determined if necessary by repeating the above process with the omission of the treatment with lead acetate. The difference between the amounts of dichromate reduced is calculated into phosphite, one atom of oxygen only being required for the complete oxidation of the phosphite radicle:



The authors have applied the method with satisfaction to the examination of a number of commercial samples of hypophosphites, including the calcium, sodium, potassium, manganese, ferrous,



and ferric hypophosphites, and describe the results in detail with different samples of the same salt, obtained from various sources.—Trans. Brit. Pharm. Conf. (Yearbook of Pharmacy), 1913, 518-523.

**Hypophosphites.**—*Their Fallacy.*—Hypophosphites first began to be used as drugs about the year 1855, and have been used more or less ever since in diseases that cause loss of nutrition. They have been recommended especially in pulmonary tuberculosis with the belief that the phosphorus was of special value in this disease, and that the hypophosphite was the best form in which to administer the phosphorus element. While there is thus very little critical evidence in favor of the use of hypophosphites, they were generally considered to be harmless in themselves. Their main danger is in encouraging the patient to seek his salvation in drugs, and most serious in nostrums instead of in the hygienic measures that have thus far proved the most successful treatment. Hypophosphites should be dismissed from the Pharmacopœia and from therapeutic use.—J. Am. M. Assoc., v. 60, 747-748. (M. I. W.)

**Phosphates.**—*Assay in Food Stuff.*—L. Sobel suggests the following simple and rapid phosphoric acid estimation in food: The material (25 grams) is finely powdered and titrated in a mortar with 3 portions of alcohol each measuring 100 Cc. The alcoholic solution is passed through a filter paper and this and the insoluble residue is washed with sufficient alcohol to make the filtrate measure 300 Cc. The fluid is chilled in ice water and an aliquot part of the clear fluid is placed in a platinum crucible and mixed with 2 to 3 grams of magnesium chloride and 3 grams of nitric acid. The alcohol is cautiously evaporated. The residue is ashed, the resultant magnesium phosphate or pyrophosphate is dissolved in warm hydrochloric acid and filtered. The filtrate is made alkaline with ammonia and the precipitated magnesium phosphate is washed with ammoniacal water and is dried, heated to redness and weighed.

The article closes with a table showing that the average egg weighs about 53.6 grams. The albumin weighs 25.8 grams, the yolk weighs 20.7 grams and the shell weighs 6.6 grams. In a second table, he shows phosphoric acid analyses of the same yolk and egg conducted by the Jucknack and the Arragon methods, as well as by the method just explained.—Schweiz. Wschr. f. Chem. u. Pharm., 51 (1913), No. 45, 677. (H. V. A.)

#### BORON.

**Boron.** *Modified Method of Detection with Tincture of Mimosa*

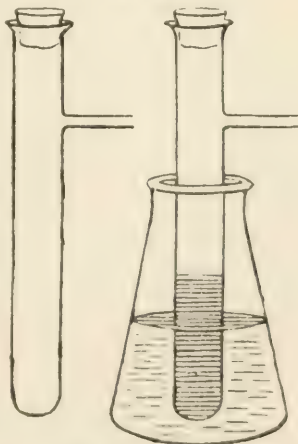


*Flowers.* Lucien Robin recommends the following modification of his method for the detection of boron with tincture of mimosa (acacia) flowers: 4 to 5 drops of the liquid under examination are placed into a flat dish of 5 to 5.5 Cm. diameter, with 2 to 3 drops of sodium hydroxide solution and 1 or 2 drops of tincture of mimosa, whereby the liquid assumes a yellow color. This color is discharged by the addition of a few drops of 5 per cent. hydrochloric acid, and the liquid is evaporated to dryness. After cooling, the residue is moistened with a large drop of 25 per cent. ammonia solution. In the absence of boron the mass becomes lemon-yellow, but in the presence of boron it assumes a rose- to blood-red color, depending on its quantity. The coloration is, however, not permanent, soon changing to a brick-red or chestnut-brown.

**Tincture of Mimosa** for this reaction is prepared by heating 5.0 Gm. mimosa (acacia) flowers for 10 minutes with 50 Cc. of 95 per cent. alcohol on a water bath, allowing to cool, filtering, and washing the residual flowers with 40 Cc. of alcohol, adding the washings to the previously obtained filtrate. A one per cent. soda solution, absolutely free from boric acid and prepared from metallic sodium, is employed for this test. *Pharm. Ztg.*, Iviii (1913), No. 64, 630; from *Bull. Soc. chim. de France* (4), 13, 602-606.

**Boric Acid.**—*Testing Apparatus.*—Some years ago F. H. Alcock described a method for testing boric acid in solution (see *Chem. and Drugg.*, 1907, I, 136), in which a test tube with a side tube is heated by a small naked flame. It has been suggested to him that the "bumping" is a serious drawback to its use; he finds, however, that a simple expedient to avoid this trouble consists in placing the tube and its contents in a conical beaker half filled with water, as shown by the accompanying cut (Fig. 60). The heating of the beaker is continued until the volatile boric compounds quietly leave the side tube and can be burnt with safety. By this means all tendency to bumping is eliminated, and, moreover, the method is rendered very delicate, for the test of the green flame is prolonged or otherwise as the heat is lowered or raised, and the surrounding of the tube by hot

FIG. 60.



Boric Acid Testing.

water allows much greater control of the rate of heating.—Chem. and Drugg., May 3, 1913, 666.

**Boric Acid.**—*Direct Titration.*—E. B. R. Prideaux recommends the direct titration of boric acid, without the addition of manitol or glycerin, using "tropäolin O" (sodium *p*-benzeneazoresorcinol-sulphonate) as indicator. Soda is first neutralized by standard hydrochloric acid in the presence of methyl orange or *p*-nitrophenol, excess of sodium chloride not materially interfering with the accuracy of the method. The indicator is in the form of a 0.04 per cent. solution. The method is recommended for the estimation of boric acid in the commercial acid, and in alkali borates.—Pharm. Journ. and Pharmacist, December 27, 1913, 949; from Ztschr. anorg. Chem., 83 (1913), 362.

**Sodium Perborate.**—*Commercial Quality.*—The results obtained by Ebrén in an investigation into the quality of sodium perborate as found in commerce show that it is nearly always badly prepared. The author prepared some of the salt as follows:—20 Gm. of sodium borate,  $B_4O_7 \cdot Na_2 \cdot 10H_2O$ , were treated with normal soda solution in sufficient quantity to transform it into metaborate,  $NaBO_2$ , and 300 Cc. of hydrogen peroxide (10 vol.), previously neutralized. After twenty-four hours' contact, the crystalline precipitate was collected and dried between folds of blotting paper. This was analyzed and the values found to correspond almost exactly with the theoretical figures, namely, residue on calcination, 42.80; loss at red heat, 57.20; weight of active oxygen, 10.40; volume of active oxygen at 0° and at 76°, 7.28 liters; alkalinity of ash as  $Na_2O$ , 20.15; boric acid as  $H_3BO_3$ , 40.30; boric acid as  $B_2O_3$ , 22.75; all the figures in percentage. Samples of this product which were kept for two years in a stoppered bottle, without special precautions, and opened every two months for examination, showed no loss of oxygen, and therefore the salt may be considered quite stable. None of the many commercial samples examined responded to the requirements indicated by the analysis of the pure product. Pharm. Journ. and Pharmacist, March 29, 1913, 435; from Journ. d. Pharm. et Chim., March 1, 1913, 245.

**Perborax.** *A New Chemical Compound.*—Sodium polyborate ( $Na_2B_6O_{10}$ ) forms with sodium perborate a new chemical compound,  $Na_2B_4O_8 + 10H_2O$ , which is known in commerce by the name "perborax." This is a stable compound which is more freely soluble than sodium perborate. The same combination can be obtained when borax is oxidized with hydrogen peroxide. It can

also be prepared by fusing together borax or boric acid with sodium peroxide or sodium perborate. Perborax has a neutral reaction and contains about 4% of active oxygen.—Bayr. Ind. u. Gewerbeblatt., 1912, 34. (O. R.)

#### CARBON.

**Coal.**—*Products of Fractional Distillation.*—L. Vignon has subjected several varieties of coal to fractional distillation, with results leading to the following conclusions:—The unsaturated hydrocarbons come off mostly before 600° C.; methane and the heavy hydrocarbons are most abundant in the neighborhood of 600°, and beyond 800° the yield rapidly diminishes. Hydrogen is in small percentage up to 600°, and reaches a maximum between 800° and 1,000°, diminishing afterwards, in most cases, at temperatures beyond these. Carbon monoxide is from 3 to 11 per cent., with an average of 6.5 per cent. for temperatures up to 850°, but this average rises to 30 per cent. above 1,000°. At higher temperatures the volume of gas is increased, but the lighting power falls off towards 1,000°, and the percentage of carbon monoxide rises.—Pharm. Journ. and Pharmacist, December 6, 1913, 841; from Chem. Trade Journ., Nov. 22, 1913, 514.

**Coal.**—*Products of Distillation under Reduced Pressure.*—A. Pictet and M. Bouvier find that when coal is distilled at a low temperature under pressure reduced to 15 or 17 Mm., the products obtained are totally different from those which result from the ordinary method of distillation as carried out in gas making. There is no ammoniacal liquor. The liquid produced is acid in reaction, and about 4 per cent. of a peculiar tar is obtained, which the author names "vacuum tar." This is quite distinct from ordinary coal tar. It is a brown fluid, lighter than water. It contains no phenols, but a considerable amount of basic constituents which may be separated by shaking out with acid. After this treatment, when distilled at normal pressures, vacuum tar gives lower fractions having the odor of petroleum, and fractions obtained at higher pressures, that of terpenes and of menthol. These are oxidized in the air and turn yellow. In many properties this vacuum tar resembles Caucasian petroleum. Vacuum tar is probably the intermediate product formed in the ordinary method of distillation. When it is itself so distilled, the usual products are obtained—gas having the characters of coal gas, ammoniacal liquor, and ordinary coal tar containing phenolic substances. This second tar contains only a small quantity of pyridine bases; but it yields a quantity of phenols to treatment with alkali. On fractional



distillation, benzene occurs in its lower, naphthalene in the middle, and anthracene in the higher fractions. Vacuum tar on further distillation therefore gives all the products of ordinary coal tar.—Pharm. Journ. and Pharmacist, December 6, 1913, 841; from Compt. rend., 157 (1913), 799.

**Carbon Dioxide.** *Physiological Production of Apnea.*—It is mentioned editorially that physiological anomalies not infrequently furnish the clue to the explanation of obscure processes in the organisms. Observers have at various times referred to the probable importance of carbon dioxide as a regulator of physiologic functions, particularly in relation to respiration and the circulation. Concordant with the generally accepted view of the rôle of carbon dioxide is the well-known fact that forced breathing is usually followed by a period of apnea of a duration depending on the extent to which the forced breathing has been performed. The most interesting factor in these newer observations is the suggestion that the circulatory system may co-operate in some cases in an unexpected degree and manner to maintain a function of the respiratory center. The assumed influence of the carbon dioxide on the blood vessels themselves will, however, bear further investigation.—J. Am. M. Assoc., v. 60, 999-1000. (M. I. W.)

**Carbon Dioxide.** *Influence on the Circulation.*—Considerable importance has lately been assigned to carbon dioxide as a regulator of various physiologic processes in the body. Haldane especially has pointed out its preeminent rôle in the orderly maintenance of the respiratory activities, and made it clear that various functions in breathing are determined, within the normal range of variations, more by the changing content of the blood in carbon dioxide than by its richness or poverty in oxygen. Henderson, in this country, has argued for the necessity of taking into account the detrimental possibilities of acapnia, *i. e.*, lowered content of carbon dioxide in the blood, in a variety of phenomena, among which the familiar cases of surgical shock are included. According to Henderson by far the greater number of all deaths under anæsthesia are fundamentally due to the acapnia exemplified in diminished carbon dioxide in the blood and tissues resulting from the excessive pulmonary ventilation during the stage of excitement. This view has furnished the scientific basis for the method of rebreathing in anæsthesia for general surgical cases, a procedure especially



championed by Dr. W. D. Gatch of Baltimore. — J. Am. M. Assoc., v. 60, 451. (M. I. W.)

#### CYANOGEN.

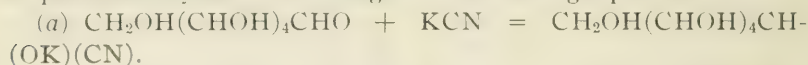
**Hydrocyanic Acid.** *Rôle in Plant Life.* Treub considers hydrocyanic acid to be the first organic nitrogen product formed by the plant from inorganic raw material. As a rule hydrocyanic acid is present in plant tissue combined with a glucosidal body. This is formed in the leaves at the expense of the sugar which is stored in the roots or rhizomes. In the case of *Sorghum vulgare*, the young shoots only contain much prussic acid, and only these are poisonous to cattle. The amount present in the leaves shows a distinct increase under the influence of sunlight. Hydrocyanic acid usually disappears from the leaves as they mature and before they fall. *Sambucus nigra* and *Indigofera galegoides* are exceptions; in them the acid is reproduced as fast as it is consumed, so that the amount remains practically constant. Under normal conditions only, leaves which contain chlorophyll produce hydrocyanic acid. But when the mature leaves are removed from *Alocasia* and the plant is kept in darkness, the etiolated leaves which are formed contain a considerable quantity of prussic acid. — Pharm. Journ. and Pharmacist, May 31, 1913, 769; from Ann. Jard. Bot. Butenzorg. (2), 8, 88.

**Zinc and Mercury Cyanide.** *A Mixture, Not a Definite Compound.* — D. B. Dott has investigated the composition of "Lister's cyanide," a compound of zinc and mercury cyanide introduced as an antiseptic, and confirms the view originally held by W. R. Dunstan, that this compound is not definite, but simply a mixture of the two cyanides. From this view, Dunstan subsequently receded, and pronounced it a definite compound. Mr. Dott's investigations, however, emphasize the fact that the product obtained either by Lister's original formula or by Mr. Dunstan's does not conform to these formulas, but is invariably short of the required percentage of mercury required; although, by a modification of the process, a "mixture" containing 35 per cent. of mercury may be obtained. — Pharm. Journ. and Pharmacist, January 25, 1913, 98.

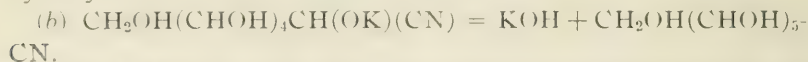
**Mercuric Cyanide.** *Disinfecting Power.* — Since most mercuric cyanide contains oxycyanide it was of importance to know whether the oxycyanide contamination affected the disinfecting action of the cyanide. At the suggestion of Professor Rupp, H. Kuhn took up the problem using a cyanide containing 33% oxycyanide

and one containing 99% oxycyanide. Tested on the cultures of bacteria coli communis, the 99% oxycyanide showed more bactericidal action than did the 33% oxycyanide; also, that the hindrance of the curdling of skim milk seems to be about the same with both chemicals; that the two chemicals seem to act with equal power on staphylococci; that the addition of sodium chloride to solutions of each of the two cyanogen chemicals increased the disinfecting power of each, the limit of bactericidal power being in a concentration of 1 to 700 as far as the cyanide or oxycyanide was concerned, and when there was twice as much sodium chloride present as there was of the cyanogen chemical. The article closes with a discussion of the above results, with special reference to the influence of the hydroxyl ions upon the action of the antiseptic on the protoplasm of the organisms attacked.—Arch. d. Pharm., 251 (1913), No. 5, 340. (H. V. A.)

**Cyanides.**—*Action on Dextrose.*—Former investigators have shown that when dextrose solutions are treated with potassium cyanide they lose their optical activity and give off ammonia. Rupp and Holzle have given the subject careful study and show that one molecule of pure dextrose combines with one molecule of potassium cyanide according to the following equations:



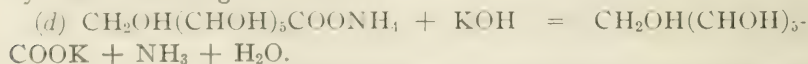
This potassium compound of glycoheptonic acid nitrile then hydrolyzes to the free nitrile as follows:



Further hydrolysis then leads to ammonium glycoheptonate by the following reaction:



This product then reacts with the potassium hydroxide (see equation "b") to form potassium glycoheptonate and free ammonia by the following reaction:

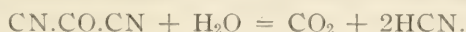


The potassium glycoheptonate thus produced can be converted into free glycoheptonic acid.

The experimental work done by the authors in arriving at these conclusions included the preparation and examination of the potassium compound shown in equation "a," the quantitative estimation of the ammonia given in equation "d," the estimation of the potassium content of potassium glycoheptonate and the isolation

and examination of the free acid and of its anhydride, which is now used in medicine as a diabetic food, under the name Hediosit. Arch. d. Pharm., 251 (1913), No. 7, 553. (H. V. A.)

**Carbon Oxycyanide.** *A New Synthetic Compound Obtained by Means of the Ultraviolet Rays.* D. Berthelot and H. Gaudechon observe that carbonic oxide, being an unsaturated compound, very readily forms additive compounds under the influence of light. Carbon oxychloride,  $\text{ClCOCl}$ , is thus formed by the direct action of sunlight on a mixture of chlorine and carbonic oxide. The chemical analogies between cyanogen and chlorine have led the authors to attempt to unite the former substance with carbonic oxide. Mixtures of the two gases were exposed in quartz vessels to the rays of a mercury lamp for about twelve hours. In the first fifteen minutes a yellow deposit was seen to form on the cooler side of the vessel. This gradually increased in amount. It proved to be the substance sought,  $\text{CNCOCN}$ . It appears to be formed in the gaseous state a little below  $100^{\circ}\text{C}$ ., for it does not appear on the warmer side of the container. Carbon oxycyanide is not volatilized when heated to  $200^{\circ}\text{C}$ ., but then gives off traces of nitrogen. In this it resembles paracyanogen. In alkalis, it dissolves, forming a yellow liquid; by hydrolysis, it is converted into carbon dioxide and hydrocyanic acid, according to the equation:



Probably hydrocyanic and cyanoformic acids are first formed. The residual gas after the completion of the experiment, besides uncombined carbonic oxide and cyanogen, contains small quantities of carbon dioxide. Generally the volumes of carbonic oxide and of cyanogen which have disappeared are equal. The combination is favored by the inevitable traces of moisture present. When phosphoric anhydride is introduced into the apparatus, only traces of carbon oxycyanide are formed after two hours' exposure. Probably the traces of carbon dioxide found are due to this minute quantity of water. Pharm. Journ. and Pharmacist, July 5, 1913, 11; from Compt. rend., 156 (1913), 1766.

**Mercuric Oxycyanide.** *Preparation.* Prof. E. Rupp proposes the following extemporaneous preparation of a one per cent. solution of mercuric oxycyanide:

Mercuric chloride.....	5.8 Gm.
Mercuric cyanide.....	5.4 Gm.
Normal volumetric solution of potassium hydroxide ....	44.8 Gm.
Distilled water, q. s., ad.....	1000 Cc.

The two cyanides are dissolved in about 800 Cc. of distilled water and the solution of potassium (or sodium) hydroxide is gradually added. Sufficient distilled water is then added to make 1000 Cc. This solution contains 10 Gm. of mercuric oxycyanide and also 2.5 Gm. of sodium chloride or 3.2 Gm. of potassium chloride, respectively.—Suedd. Ap. Ztg., 1913, No. 85. (O. R.)

## METALS

### ALKALIES.

**Potassium.**—*Estimation as Chloroplatinate.*—G. Meillère observes that the separation of sodium from potassium, which depends on the insolubility of the chloroplatinate of the latter in alcohol, is a simple though delicate operation. The chief difficulty is to avoid the precipitation of the double salt of platinum and sodium, but its formation is readily discernible by its color and distinct crystalline form. To avoid it, evaporation should not be carried to completion, the alcohol should not be too concentrated, and the quantity of platinum chloride used should be slightly above that required to form the double salt. Acetone, however, may be used instead of alcohol, without risk of introducing error due to sodium salt. —Pharm. Journ. and Pharmacist, July 5, 1913, 11; from Ann. chim. Analyt., May 15, 1913, 183.

**Potassium.**—*Detection with Tartaric Acid.*—S. W. Winkler recommends that in testing for potassium with tartaric acid, this should be used in substance (powder) instead of solution, since the powder always contains very small traces of acid potassium tartrate which serves to incite the crystallization of the acid tartrate from the potassium in the liquid under examination. Dr. H. Reckleben, however, questions the reliability of this method, since failure to observe the proper degree of concentration may on the one hand prevent the precipitation of acid potassium tartrate, and, on the other, give a positive reaction notwithstanding the absence of potassium ions in the liquid. Dr. Reckleben therefore suggests the following procedure: To the liquid under examination, which must not be too dilute, a tolerably concentrated solution of acid tartrate of sodium is added at ordinary room temperature. If no crystallization results, notwithstanding the sides of the beaker are gently rubbed with a glass rod, the small quantity of liquid adhering to the rod is rubbed on a watch-glass with one drop of a 10 per cent. solution of a potassium salt until crystallization results. Then with traces of the crystals adhering to the



end of the rod, the liquid under examination is inoculated, whereupon crystallization results if potassium ions are present.—Pharm. Ztg., lviii (1913), No. 57, 561; from Ztschr. f. angew. Chem., 1913, No. 49.

**Alcoholic Solution of Potash.**—*Criticism of Proposed Methods of Preparation.*—R. Gaze says that a method of making alcoholic potash solution which will keep without turning brown was recommended some time ago, but it has since been stated by Malfatti that it is not successful, and an alternative method has been proposed. The former method was to dissolve 66 grams of caustic potash (purified by alcohol) in 66 Cc. of water, cool, and add gradually, with shaking, to absolute alcohol in a liter flask, which is finally filled up to the mark with absolute alcohol and well shaken. After standing twenty-four hours the liquid is filtered, and is to be kept in a bottle of white glass in the light. Malfatti's method is to mix the required amount of potash with rather more than its own weight of quicklime, moistening it with alcohol, and after thoroughly mixing transferring it to a flask by aid of alcohol; the requisite quantity of alcohol having been added, the whole is shaken frequently until the potash is all dissolved; finally it is filtered. It is stated that this solution does not turn brown on keeping a year, even when access of air is permitted. To compare the two methods, the author prepared a solution by the original method and three solutions according to Malfatti's directions, using for two of these quicklime in pieces and for the other powdered quicklime. After keeping for one and a quarter years the first solution was colorless; one prepared by Malfatti's method with lime in pieces was slightly yellowish and the other yellowish brown; the one prepared with lime in powder was yellow.—Apoth. Ztg., 28 (1913), 174.

**Sodium Carbonate (Dried).**—*Chemical Formula.*—The German Pharmacopœia, fifth edition, orders the crystallized sodium carbonate to be dried at ordinary temperature and then at a temperature between 40° and 50° C., until it has lost  $\frac{1}{2}$  of its original weight. *Natrum carbonicum siccum* of the German Pharmacopœia consequently contains about 75 per cent. of the anhydrous sodium carbonate, and should correspond to the chemical formula  $\text{Na}_2\text{CO}_3 + 2\text{H}_2\text{O}$ . (O. R.)

**Sodium Carbonate (Dried).**—*Commercial Quality.*—Dr. P. Bohrisch has examined a great many samples of so-called dried sodium carbonate and finds them to differ greatly in

their content of absolute sodium carbonate. A great deal of *anhydrous* sodium carbonate is sold under the name of *Natrium carbonicum siccum*. The author therefore recommends that a pharmacist himself could easily prepare this salt, namely, by drying for several days at room temperature. (The U. S. P. has for a long time recognized the variability of sodium carbonate, especially in crystal form and has therefore adopted a new salt that is the monohydrated sodium carbonate, which is practically permanent.)—Ph. Zhalle., 1913, No. 46. (O. R.)

**French Table Salt.**—*Bacterial Contamination.*—In France "bay salt" is used for the preparation of table salt and for curing dietetic articles, as well as rock salt. A. Androuard says that both forms as met with in commerce frequently contain enormous numbers of bacteria and molds. In the Southwest and South of France the preparation of rough and refined bay salt is an important industry. The sources of bacterial contamination of this are many. In the first place, the sea water itself is often rich in bacteria. Then, again, during the process of spontaneous evaporation in the salt pans further contamination occurs. It is handled with implements which are themselves very dirty, and no precaution is taken against the most serious contamination. Rock salt, if properly treated, should give products which are virtually germ-free. But so little care is taken during the process of crystallizing and "refining" that it is as bad bacteriologically as bay salt, and has been found to contain 8,300 bacteria and 400 molds per gram. The author insists that the whole salt industry should be supervised, and that only sterilized refined salt should be permitted to be used as a condiment or for pickling dietetic articles. It is shown that brine is not really germicidal; it does not kill the spores, but merely prevents their development. When the pickle is diluted an enormous number of bacteria are developed. The continued use of pickle for a long period should be forbidden.

Pharm. Journ. and Pharmacist, May 3, 1913, 629; from Répert. de Pharm., 25 (1913), 164.

**Ammonia.**—*Estimation with Boric Acid.*—L. W. Winkler proposes a solution of boric acid for the absorption of ammonia instead of hydrochloric or sulphuric acid, as ordinarily used, titrating directly with acid, using methyl orange or Congo-red as indicator. The boric acid is so feeble an acid that it scarcely affects the color of the solution, and if there be plenty of boric acid the ammonia is completely absorbed. The change of color is extremely sharp on

titrating with hydrochloric acid. The strength of the solution used is about 3 of boric acid to 100 of distilled water. In trapping the ammonia in Kjeldahl's process for the estimation of nitrogen a 5 per cent. solution of boric acid is used. Pharm. Journ. and Pharmacist, December 27, 1913, 949; from Chem. Trade Journ., December 13, 1913, 593.

**Lithium Poisoning.**—S. A. Cleaveland reports a case of poisoning by lithium accompanied by marked muscular and great general weakness and marked tremors; also by the occurrence of vertigo and eye and ear symptoms resembling those of cinchonism, and the entire absence of gastro-intestinal symptoms. J. Am. M. Assoc., v. 60, 722. (M. I. W.)

#### ALKALINE EARTHS.

**Calcium.**—*Direct Determination as Oxalate.*—S. Goy observes that calcium is usually determined gravimetrically by precipitating as oxalate, collecting and decomposing the precipitate and weighing as either  $\text{CaO}$  or  $\text{CaCO}_3$ . This requires prolonged heating with a blowpipe flame, and usually several weighings have to be taken before the weight is constant. The method thus occupies much time, and since only one precipitate can be heated by the blowpipe at once, it is quite unsuitable when a series of calcium determinations has to be made. Attempts were therefore made to obtain satisfactory results by weighing as oxalate, and this was perfectly successful if the following details were adhered to:—The liquid containing the calcium is precipitated by ammonium oxalate while boiling, and then kept hot on a water bath while the precipitate settles; the latter is then collected in a Gooch crucible, the asbestos in which is carefully and closely packed to prevent any crystals passing through; it is washed three or four times with small quantities of hot water until the washings contain no oxalate, and then dried at  $100^\circ$  to  $105^\circ$  for about four hours; its composition is then exactly  $\text{CaC}_2\text{O}_4 \cdot \text{H}_2\text{O}$ . It may be dried for many hours further without change of weight, but at  $130^\circ$  it slowly loses water. If collected on a filter paper instead of a Gooch crucible it cannot be dried at  $105^\circ$  without loss. A large number of control tests showed that the method gives perfectly accurate results. Pharm. Journ. and Pharmacist, December 20, 1913, 911; from Chem. Ztg., November 1, 1913, 1337.

**Lime.**—*Variable Requirement in the Dietary.*—There is considerable neglect, in a practical way, of the bearing of the variable requirement

of inorganic salts in human nutrition. The lime requirements as well as those for other inorganic substances vary with the physiologic conditions and activities of individuals. Some of the most popular human foods, such as bread and meat, are so deficient in calcium that these needs deserve conspicuous statement. The limits of safety are still to be learned. —J. Am. M. Assoc., 1913, v. 61, 200. (M. I. W.)

**Lime.**—*Some Underlying Facts Regarding Its Therapy.*—The possibility of successfully feeding lime-salts to growing individuals is now undisputed. Demonstration, however, is not easy; for it must be recalled that calcium may be both absorbed and excreted by the bowel, so that only careful balances of intake and output over longer periods can give a final answer as to whether or not the actual store of lime has been enriched.—J. Am. M. Assoc., 1913, v. 61, 494–495. (M. I. W.)

**Barium Sulphate.**—*Examination of Purity.*—Guerin proposes the following test in order to prevent any accidents, some of which have even resulted fatally by the use of barium sulphate, when examinations are made by means of the Roentgen rays. 15 to 20 Gm. are agitated with 100 Cc. of one per cent. hydrochloric acid, then mixed with filter-paper pulp and filtered until clear. A few drops of this filtrate when evaporated on a watch-glass should leave no residue. One part of the filtrate is mixed with diluted sulphuric acid, and another part of the filtrate is exactly neutralized with ammonia water, and a few drops of potassium dichromate solution are added. In neither case should the solution become turbid. Journ. Pharm. Chim., 1913, 282. (O. R.)

**Magnesium Salts.** The widely familiar method of inducing narcosis by the subcutaneous injection of magnesium sulphate, introduced some years ago by Meltzer and Auer, is capable of producing a profound depression of the animal organism. Meltzer and Auer have recently brought forward new evidence to show that magnesium salts affect also the central nervous system. In the absence of more compelling evidence, the condition of depression induced by magnesium may still be regarded as one of anaesthesia in which there is an inhibition of the entire nervous system, not alone its peripheral branches. J. Am. M. Assoc., 1913, v. 61, 1544. (M. I. W.)

**Magnesium Perhydrol**, 25 per cent., is a mixture consisting essentially of magnesium peroxide and magnesium oxide with water



of hydration, containing not less than 25 per cent. of magnesium peroxide ( $\text{MgO}_2$ ).—J. Am. M. Assoc., v. 60, 1792. (M. I. W.)

**Beryllium Arsenite.** *Attempts to Prepare a Definite Salt.*—B. Bleyer and B. Müller have been unable to prepare a definite arsenite of beryllium either by double decomposition between alkali arsenites and beryllium salts or by the action of beryllium hydroxide on solutions of arsenous acid. Beryllium hydroxide will remove arsenous acid from solution, the amount depending upon the relative proportions of hydroxide and acid and upon the temperature. The action is much more marked when the hydroxide is precipitated in the nascent state in the solution of arsenous acid than when a separately prepared beryllium hydroxide is used.—Pharm. Journ. and Pharmacist, July 5, 1913, 11; from Arch. d. Pharm., 1913, 304.

#### ALUMINIUM.

**Aluminium.**—*Action of Hydrogen Peroxide.*—Droste has made the following observation on the action of hydrogen peroxide upon aluminium:—An aluminium beaker which had not been used for either acid or alkali showed a number of spots on the bottom and sides, at which the metal had exfoliated and partly changed to a grayish white powder. Inquiry showed that it had been used for a 3 per cent. solution of hydrogen peroxide, which, however, had not remained in it for any considerable time. Analysis of the beaker showed it to consist of aluminium 99.46, iron 0.03, silicon 0.51 per cent. A small piece of the metal was placed in 3 per cent. peroxide solution in a brown medicine bottle, and in another a small quantity of raspings in the same liquid. The metal was almost entirely dissolved in the first case in thirty days, and in the second in forty-five days; the small quantity remaining undissolved was black, and was found to consist of particles of aluminium and silicon. The liquid contained a bulky precipitate, which was found to be  $\text{Al}_2(\text{OH})_6$ ; no soluble colloidal hydroxide appeared to be formed. Pharm. Journ. and Pharmacist, December 20, 1913, 911; from Chem. Ztg., October 28, 1913, 1317.

**Bolus Alba.** *Purification Necessary for Making Silver Nitrate Pills.*—H. Franck finds that the impure bolus alba of the G. P. V is not suitable for the preparation of silver nitrate pills owing to the presence of metallic salts which are liable to decompose the silver salt. He therefore recommends the use of purified bolus which should conform to the following requirements:—If 1 Gm.

of the bolus is boiled with 1 Gm. of hydrochloric acid and 20 Cc. of water, the filtrate should not be blued on the addition of 0.5 Cc. potassium ferrocyanide T.S. (abs. of *Iron*). When neutralized with ammonia the filtrate should not be changed by ammonium oxalate T.S. (abs. of *Calcium*); nor, after addition of ammonium chloride and ammonia in excess, should the filtrate be changed on adding sodium phosphate T.S. (abs. of *Magnesium*).—Pharm. Ztg., lviii (1913), No. 29, 289; from Apoth. Ztg., 1913, No. 26, 232-233.

**Terra Alba.**—*Commercial Quality.*—George E. E'we and Charles Vanderkleed state that this earth, usually considered to be a silicate of aluminum, is now considered among the trade to be a non-setting form of calcium sulphate and that for many pharmaceutical purposes this is unsatisfactory.—Proc. Penn. Phar. Assn., 1913, 326. (E. C. M.)

**Kaolin, Silica, Etc.**—*Melting Points.*—The following melting points have been obtained by C. W. Kanolt:—Kaolin,  $1740^{\circ}$  C., pure alumina,  $2010^{\circ}$ ; pure silica,  $1750^{\circ}$ ; bauxite,  $1820^{\circ}$ ; bauxite clay,  $1795^{\circ}$ ; chromite,  $2180^{\circ}$ . It is pointed out that the value given for silica is not the true melting point, but represents approximately the temperature at which silica flows distinctly.—Pharm. Journ. and Pharmacist, March 15, 1913, 367; from Tech. Papers, Bureau of Standards, through Nature, February 13, 1913, 658.

#### GALLIUM.

**Gallium.**—*Occurrence in Commercial Aluminium in Appreciable Quantities.*—C. Boulanger and J. Bardet observe that a spectroscopic examination of several samples of commercial aluminium revealed the presence of gallium with such intensity as to suggest that it might be present in sufficient quantity to enable it to be isolated and the amount determined. Consequently 1.7 Kgm. of the metal was converted into hydrochloride, and, by appropriate treatment, 0.3895 Gm. of gallina,  $\text{Ga}_2\text{O}_3$ , equivalent to 0.017 per cent. of metallic gallium, was separated in a pure condition. Subsequently several specimens of bauxite were examined, and spectroscopic evidence of the presence of gallium was obtained from all. A. de Gramont has previously detected a gallium in the feldspars of several rocks, Urbain has detected it in blendes, and Bardet has found it in the water of a number of mineral springs. It seems, therefore, to be widely distributed, and always to accompany aluminium in nature as a satellite. Pharm. Journ. and Pharmacist, November 22, 1913, 773; from Compt. rend., 157 (1913), 718.

## CHROMIUM.

**Chromium and Manganese.** *Improved Method of Separation.*—

In the ordinary analytical course chromium and manganese are usually separated by reducing the melt containing the two metals with sodium nitrite and then effecting their separation by means of barium carbonate. W. Cornelius however finds that although the method gives excellent results, it is unnecessarily tedious and consumes much time, but that the process may be markedly shortened by the following simple modification without suffering in accuracy: If a solution of the chrome-manganese melt is heated upon the water bath with an aqueous solution of sodium nitrite ( $\text{NaNO}_2$ ), the manganese is completely precipitated as a voluminous peroxide hydrate ( $\text{MnO} \cdot (\text{OH})_2$ ), whereas the chromium remains in solution as neutral chromate. The peroxide is removed by filtration, carefully washed, reduced to manganous oxide ( $\text{MnO}$ ) by heating to redness, and weighed. The filtrate and washings are now acidulated with hydrochloric acid, more  $\text{NaNO}_2$  being added if necessary, whereupon the chromium compound is instantly converted into chromic chloride ( $\text{CrCl}_3$ ), from which the hydrated peroxide ( $\text{Cr}(\text{OH})_3$ ) is precipitated on the addition of ammonia, and, after reduction by heat, weighed as oxide ( $\text{Cr}_2\text{O}_3$ ). The author gives analytical data in support of his proposition. Pharm. Ztg., lviii (1913), No. 43, 427.

**Chromium Oxide.**—*Quantitative Separation from Its Admixtures with Iron Oxides.*—F. Bourion and A. Deshayes recommend the following method for the quantitative separation of chromium and iron oxides:—To a weighed quantity of the mixed oxides about an equal bulk of ammonium sulphate is added, and the mixture is heated in a tube in a current of dry chlorine. The ammonium salt fuses and is decomposed, leaving a porous residue. Over this a slow current of chlorine saturated with sulphur protochloride is passed for four hours, the temperature being maintained at between  $500^\circ$  and  $650^\circ$  C. In this manner the whole of the chromic oxide is converted into chromic chloride which is insoluble in water, while the ferric chloride is extremely soluble. On treatment with water, therefore, the former is obtained free from iron. The method is applicable to the separating of magnesium and iron from chromium in such substances as chromite. Pharm. Journ. and Pharmacist, July 5, 1913, 11; from Compt. rend., 156 (1913), 1769.

**Sodium Dichromate.**—*Solubility in Alcohol.*—Reinitzer finds

that while potassium dichromate is completely insoluble in alcohol, sodium dichromate is soluble in absolute alcohol to the amount of about 5 per cent. The solution, however, decomposes after a few minutes, becoming turbid and producing a brown precipitate, while the liquid after a time acquires an aldehyde odor.—*Pharm. Ztg.*, lviii (1913), No. 75, 750; from *Ztschr. f. angew. Chem.*, 1913, No. 65.

**Chromium Sulphate.**—*Pharmacology.*—S. Kolipinski is quoted as saying: "The diseases in which chromium has been used with success are: cirrhosis of the female breast; castration, menopause, functional impotency in men, chronic alcoholism, nervous vomiting and vomiting in pregnancy, neurasthenia, locomotor ataxia, exophthalmic goiter and the migraines."—*J. Am. M. Assoc.*, 1913, v. 61, 1921. (M. I. W.)

#### MANGANESE.

**Manganese.**—*Determination of Small Quantities in Drinking Water.*—Dr. Fr. Haas proposes the following method for determining small quantities of manganese in drinking water: In an Erlenmeyer flask 100 Cc. of the water are acidulated with 5 Cc. of 20 per cent. sulphuric acid, 0.5 to 1.0 Gm. of potassium persulphate is added and the mixture is heated slowly until either a red-violet or a brown color, due to precipitated persulphates, is developed. After cooling, a trace of sodium bisulphite is added and the reaction is repeated by very carefully heating. As soon as the coloration has reached its greatest intensity, the flame is removed and, after cooling, compared in the colorimeter with a 1/100 N solution of potassium permanganate, of which 1 Cc. corresponds to 0.11 Mgm. of manganese. *Pharm. Ztg.*, lviii (1913), No. 401, 397; from *Ztschr. f. Unters. d. Nahr. u. Genussm.*, 1913, No. 6.

**Manganese.**—*Poisonous Effects.*—Louis Casamajor reports an unusual form of mineral poisoning affecting the nervous system of workers in the separating mill connected with a large mine from which zinc is the principal product. The conditions are of toxic origin and the greatest possibility is that the toxic agent is manganese.—*J. Am. M. Assoc.*, v. 60, 646-649. (M. I. W.)

**Potassium Permanganate.**—*Use as a Local Anæsthetic.*—Wilfred M. Barton reports several experiments to demonstrate the anæsthetic properties of diluted solutions of potassium perman-



ganate on the mucous membrane of the urethra. J. Am. M. Assoc., 1913, v. 61, 196-197. (M. I. W.)

**Potassium Permanganate.** *Use in the Quantitative Estimation of Some Organic Compounds.*—C. M. Pence states that a number of organic compounds are capable of quite accurate determination by means of potassium permanganate, using the following modification of Tocher's method for the determination of phenol:

Dissolve 0.04 Gm. phenol in 1000 Cc. distilled water. Place 50 Cc. N 10  $\text{KMnO}_4$  and 3 to 4 Gm. sodium bicarbonate in a 500 Cc. glass-stoppered Erlenmeyer flask. Add 25 Cc. of the phenol solution with a gentle rotation. Boil 5-10 minutes, with stopper removed, cool flask to about  $60^\circ \text{C}$ ., and acidify with dilute sulphuric acid, let stand about two minutes, and cool to room temperature. Dilute with distilled water, add 5 Cc. 20% potassium iodide solution and titrate the liberated iodine with N 10 thio-sulphate solution, using starch as indicator.

The number of Cc. of N 10 thiosulphate subtracted from the number of Cc. permanganate originally added, equals number of Cc. of permanganate consumed by the phenol.

"1 Cc. N/10  $\text{KMnO}_4$  = .000336 Gm. phenol."

Very good results were obtained when working on pyrogallol, pyrocatechin, resorcinol, hydroquinone, salicylic acid, and salol.—Journal Ind. and Eng. Chem., v. 5, March, 1913, 218. (L. A. B.)

#### IRON.

**Reduced Iron.**—*Critical Review of the Different Pharmacopœial Methods for Estimating the Iron.*—At the sixtieth annual meeting of the Association (Denver), O. E. Winter presented an admirable review of the methods directed in all the existing pharmacopœias, which are quoted in full, and gives the results of his experimental investigations of their respective merits or advantages. He says that in the opinions offered on these various methods, these seem to be about equally divided as to whether the percentage of the *total iron* or of the *metallic iron* shall be taken as standard by which the value of reduced iron is to be gauged, the requirements of the various pharmacopœias being as follows:

Dutch....	84.6% of metallic iron	Japanese....	90% of pure iron
German..	90% of metallic iron and 96.6% of total iron	British.....	Not less than 75% of metallic iron
Italian...	98% of total iron	Danish.....	90% of metallic iron
Swiss....	90% of metallic iron	Hungarian...	80% of metallic iron
Swedish..	90% of metallic iron	United States.	90% of metallic iron

For estimating the total iron, the method which is described in the text of the Dutch, German and Italian Pharmacopœias stands out most prominently. In this process the iron is dissolved in acid, the resulting ferrous salt oxidized with potassium permanganate and the ferric salt estimated iodometrically in the usual way.

For the estimation of metallic iron only, the mercuric chloride method as given in the Swiss, Belgian and Swedish Pharmacopœias and in Krauch-Merck, "Chemical Reagents, Their Purity and Tests" (1907, page 116), and the iodometric method described in the United States, Austrian, and Japanese Pharmacopœias are applied. The French Codex gives a gasometric method; the British Pharmacopœia, one in which the iron is mixed with copper sulphate and the ferrous salt formed is titrated with standard bichromate solution; the Danish Pharmacopœia, one in which the iron is acted upon by ferric chloride in an atmosphere of  $\text{CO}_2$  in order to prevent oxidation, titrating the resulting ferrous salt with standard permanganate solution. The Hungarian Pharmacopœia simply directs to glow the iron in the air and weigh the oxide formed.

These methods were applied to two samples of reduced iron, A and B, and the results were tabulated. Sample B contained sulphide in an excess of the amount allowed by the U. S. P., this sample being examined in order to ascertain whether or not sulphides had any influence on the results obtained by these processes. The results have shown that the presence of an excess of sulphide has no appreciable effect upon the results obtained with the method given for total iron or with the iodometric process, but that, when the mercuric chloride method is used—to which, as modified by Krauch-Merck's method, the author gives the preference—a reaction seems to take place between the iron sulphide and the mercuric chloride, as the result of which figures are obtained which are apparently too high. However, when the sulphides are within the limit allowed by the U. S. P., the modified mercuric chloride method is the most satisfactory, and is recommended by the author on account of its accuracy, simple manipulation, and shortness in carrying out.—Journ. A. Ph. A., March, 1913, 296-300.

**Iron.**—*Absorption by Plants.*—W. Vaubel says that on general grounds it appears possible that iron may be taken up by plants in the form of the bicarbonate or the salt of humic acid. It is suggested as an alternative explanation that a molecular compound of iron and ammonium nitrate described by the author may be formed in the soil and absorbed by plants. The compound is

formed by the action of ammonium nitrate upon metallic iron, oxides and hydroxides of iron being produced at the same time, or by boiling ferrous sulphate with solution of ammonia. The compound is stable only in its solutions, which are colorless or grayish black according to concentration, and which do not give the usual tests for iron. In this form the iron is protected from the active materials occurring in plants, and may proceed unchanged to the places where it exercises its physiological action. Pharm. Journ. and Pharmacist, October 18, 1913, 573; from Chem. Ztg., 73 (1913), 737.

**Monohydrated Ferrous Sulphate.** *Preparation and Use in Volumetric Analysis.* D. Florentin recommends monohydrated ferrous sulphate,  $\text{FeSO}_4 \cdot \text{H}_2\text{O}$ , as being specially useful for the standardization of permanganate solution. The salt is non-hygroscopic and non-oxidizable under normal conditions, losing its molecule of water only at high temperatures. It can be heated for several hours in an oven at  $120^\circ$  without loss of weight, and may be prepared as follows:—Ferrous sulphate is first purified by crystallizing two or three times from slightly acid solution (sulphuric), and then dried. Of this, 400 Gm. are placed in a 500 Cc. flask with 200 Cc. of 50 per cent. (by weight) sulphuric acid. The mixture is gently heated on the water bath, with agitation, until there is deposited a white crystalline powder. The heating is continued for a few moments more, filtered, and the crystalline deposit washed with 96 per cent. alcohol, or anhydrous acetone, then with anhydrous ether, and finally dried over sulphuric acid. There are thus obtained about 40 Gm. of the monohydrated salt. The method of preparation ensures absence of ferric sulphate. It dissolves readily in cold water, but less quickly in warm acidulated water. Treated with boiling distilled water, yellow basic salts are formed. About 2 Gm. of the salt placed in a capsule lightly covered with paper and kept for fifteen days in the laboratory were not found to have varied in weight. Pharm. Journ. and Pharmacist, June 14, 1913, 839; from Bull. Soc. Chim., April 5, 1913, 362.

#### RADIUM.

**Radium.** *Chemical Reactions.* Kailan has observed that the rays of radium reduce ferric sulphate to the ferrous state, and that the reduction is favored by the presence of organic matter, such as cane sugar. Water is partially transformed into hydrogen peroxide by the rays, and the action is greater in the case of acid water, and slighter on alkaline. Acidified solutions of potassium bromide

are decomposed, the rate of decomposition increasing with the concentration of the salt or acid. The rays do not accelerate etherification, but provoke, though slightly, isomerization of certain organic substances. They have no influence on a 25 per cent. oxalic acid solution during a period of one thousand hours, but they transform neutral solutions of cane sugar, at least partially, into a mixture of glucose and levulose. —Pharm. Journ. and Pharmacist, May 31, 1913, 769; from Chem. Trade Journ., May 17, 1913, 518.

**Radium.** *Use in Internal Medicine.*—Rowntree and Baetjer present a comprehensive review of the literature relating to the physiologic and pharmacologic effect of radium and a report of their own observations in connection with a number of cases which led them to conclude that the most favorable results observed have been in the cases of arthritis deformans of the infectious type in which three out of the five patients showed some slight but definite improvement. The authors are unwilling to draw any conclusions as to the efficacy of this form of therapy believing that any form of medication which has yielded the results reported by the European writers should be the subject of a much more exhaustive test, until its real value can be definitely established and its limitations rationally outlined.—J. Am. M. Assoc., 1913, v. 61, 1438-1441. (M. I. W.)

**Radium.** *Use in Skin Diseases.* Frank E. Simpson presents a preliminary note on the action of radium in skin diseases based on the study of 45 patients with 15 different skin affections. The cases to be treated with radium should be selected with the greatest care in order not to deprive patients of other treatment that may be more effective.—J. Am. M. Assoc., 1913, v. 61, 80-82. (M. I. W.)

**Radium.** *Exploitations by the Nostrum Faker.*—The readiness with which the quack and nostrum faker have adopted the unproved virtues of radioactivity in the prosecution of their lucrative nefarious practices is familiar to those readers who have followed the Propaganda for Reform and have become acquainted with the exploitations of Radol, Radio-Sulpho, and others of that class. Despite this unfortunate misuse of the newer contributions of chemistry which include discoveries that already have revolutionized our ideas regarding the constitution of matter, it must be admitted that radium with its unknown possibilities as well as its



marvelous properties has entered into both medical thinking and doing in a way that cannot be overlooked.—J. Am. M. Assoc., v. 60, 1882-1883. (M. I. W.)

**Radium.**—*Exploitation of "Radioactive Waters."*—Our national government is not only allowing the deposits of what is already known to be a therapeutic agent of value to fall into the hands of private commercial interests, but also is actually a party to the exploitation of "radioactive waters" in a manner for which there is at present no justification.—J. Am. M. Assoc., 1913, v. 61, 969. (M. I. W.)

**Radium and Mesothorium.** *Medicinal Uses.*—The medical profession has not decided as yet which of these two chemicals is the better in the treatment of external cancer. The impression seems to be that radium exerts a more powerful action than the same amount of mesothorium. The medical congress at Halle decided that mesothorium even when applied in large quantities does not produce any bad effects. This cannot be said of radium.—Suedd. Ap. Ztg. 1913, No. 81. (O. R.)

#### STANNUM.

**Tin.**—*Volumetric Estimation.*—Fr. Fischer and E. Müller find the method of Zschokke well adapted for the volumetric estimation of tin. The tin is first precipitated from its saline solution with metallic aluminium, then dissolved in hydrochloric acid, and the solution of stannous chloride titrated with potassium bromate V. S. until a yellow color is permanently developed. The reaction is as follows:  $3\text{SnCl}_2 + 6\text{HCl} + \text{KBrO}_3 = 3\text{SnCl}_4 + \text{KBr} + 3\text{H}_2\text{O}$ . The yellow color, due to liberated Br, is developed by the action of bromic acid on the hydrobromic acid when all the stannous chloride has been converted into stannic chloride.—Pharm. Ztg., lviii (1913), No. 31, 311; from Chem. Ztg., 1913, No. 31.

#### LEAD.

**Lead Peroxide.**—*Rapid Commercial Method for Its Estimation in Red Lead.*—The "Chem. Eng. and Works Chemist" (July, 1913, 188) gives the following rapid method for estimating lead peroxide in commercial red lead: The reagent used is a 12% solution of hydrazine acetate, made by adding hydrazine sulphate in powder to a solution of barium acetate. It is then acidified with 10% of pure acetic acid. About 1 Gm. of the red lead to be tested is boiled with 30 or 40 Cc. of water till all the air is driven out of

the water, then 20 Cc. of the reagent is added while the liquid is still hot. Nitrogen is evolved according to the equation:— $2\text{PbO}_2 + (\text{NH}_2)_2(\text{C}_2\text{H}_4\text{O}_2)_2 = 2\text{Pb}(\text{C}_2\text{H}_3\text{O}_2)_2 + 4\text{H}_2\text{O} + \text{N}_2$ . The nitrogen is collected, and from its volume, corrected to normal temperature and pressure, the quantity of lead peroxide is calculated,  $2\text{PbO}_2$  yielding  $\text{N}_2$ . Thus there is evolved 22.4 liters of nitrogen for every 478 Gm. of lead peroxide, or 0.02134 Gm. of peroxide in the red lead sample for every Cc. of nitrogen.—Pharm. Journ. and Pharmacist, August 9, 1913, 249.

**White Lead.**—*Toxicity.*—Occupation is undoubtedly the most important factor in the etiology of lead poisoning and among the occupations most dangerous are those in which the lead is freely handled.—J. Am. M. Assoc., v. 60, 603. (M. I. W.)

**Lead Salts.**—*Solubility in the Human Gastric Juice.*—Carlson and Woelfel submit a report of investigation to determine the solubility of lead salts in human gastric juice, and its bearing on the hygiene of the lead industries. As a practical result of the observations it was determined that lead carbonate was much more toxic than the lead sulphate, though both may produce acute lead poisoning. In addition to taking other prophylactic measures lead workers should drink a glass of milk between meals, in order to diminish the chances for any swallowed lead to be dissolved by the free hydrochloric acid of the gastric juice.—J. Am. M. Assoc., 1913, v. 61, 181–184. (M. I. W.)

#### COPPER.

**Copper.**—*Effect on Tuberculous Lesions.*—Corper, DeWitt, and Wells report observations on the effect of copper on experimental tuberculous lesions. They were unable to secure any appreciable effects in experimental animals and their experience is not in harmony with the experimental results described by others in regard to the clinical use of copper. They have made no clinical observations whatever. J. Am. M. Assoc., v. 60, 887–889. (M. I. W.)

**Colloidal Copper.**—*Effect in Cancer Treatment.*—Richard Weil reports some observations on the effects of colloidal copper with an analysis of the therapeutic criteria in human cancer. The material was made according to the method originally employed by Loeb and the copper of the resulting solutions is probably present in the form of an oxide or hydroxide. The preparation was administered to 12 cases of malignant disease and the treatment resulted in most

of the cases in the production of mild constitutional effects, but the treatment did not appear to exert destructive action on the tumor tissue in any of the cases.—J. Am. M. Assoc., 1913, v. 61, 1034-1040. (M. I. W.)

#### MERCURY.

**Mercuric Oxide.**—*Use as a Standard for Volumetric Analysis.*—Up to the present time no single substance could be used for the four chief volumetric operations—acidimetry and alkalimetry, iodimetry, oxidimetry, and argentometry—but L. Rosenthaler and A. Abelman claim to have found this in mercuric oxide. All the properties demanded in a standard substance are satisfied by mercuric oxide. Its preparation is simple, and it can be obtained pure in commerce at a cheap rate. If protected from the light, mercuric oxide is absolutely stable, while it contains no water of crystallization, nor is it hygroscopic. Its use in the volumetric analysis mentioned is explained in the following:

**Alkalimetry and Acidimetry.**—The method used depends upon the fact that mercuric oxide in the presence of sodium chloride dissolves in the equivalent quantity of hydrochloric acid to form the neutral compound  $\text{HgCl}_2 \cdot 2\text{NaCl}$ , according to the following equation:— $\text{HgO} + 2\text{HCl} + 2\text{NaCl} = \text{HgCl}_2 \cdot 2\text{NaCl} + \text{H}_2\text{O}$ . Hence it follows that 1 Cc. of decinormal hydrochloric acid is equivalent to 10.8 Mgm.  $\text{HgO}$ . The standardization with mercuric oxide is best conducted as follows:

A weighed quantity of mercuric oxide is dissolved in excess of decinormal hydrochloric acid by warming on a steam bath with the addition of sufficient neutral sodium chloride solution. After cooling, the excess of acid is titrated back with decinormal caustic soda solution. As indicator, nitrophenol or iodoeosin may be used. For the standardization of the decinormal acid, sodium oxalate, as recommended by Sorensen, was used.

**Iodimetry.**—Rupp's method for the determination of mercury is the basis of the use of mercuric oxide as a standard in iodimetry, 1 Cc. of decinormal iodine solution being equivalent to 10.8 Mgm.  $\text{HgO}$ . The process is as follows:

Mercuric oxide is dissolved in hydrochloric acid in a glass-stoppered flask, and sufficient potassium iodide is then added so that the precipitate of mercuric iodide first formed redissolves. The solution is then made alkaline with 10 to 20 Cc. of 10 per cent. caustic potash, and, while rotating the flask, a mixture of about 3 Cc. of pure formaldehyde solution (35 per cent.) and 10 Cc. of

water is added. After shaking for about three minutes the mixture is acidified with dilute acetic acid, again shaken thoroughly, and excess of decinormal iodine solution added. After vigorous shaking and noting that no more mercury remains undissolved at the bottom of the flask, the excess of iodine is titrated with or without the use of starch solution.

**Oxidimetry.**—The reduction of mercuric oxide to mercury with formaldehyde as in the foregoing section, or by means of potassium arsenite in alkaline solution, is the basis of the oxidation method. The reduced mercury is filtered off, washed, and converted into mercuric sulphate by means of potassium permanganate and sulphuric acid, the excess of potassium permanganate being titrated with oxalic acid, 1 Cc. of decinormal potassium permanganate solution being equivalent to 0.0108 Gm. HgO. After many trials the standardization was carried out as follows:

The process was carried out as described above so far as the precipitation with formaldehyde. After some minutes the whole was filtered through an Allihn tube provided with glass wool below, and over it a very deep layer of asbestos, and washed with distilled water until the washings no longer gave a violet color when tested with morphine-sulphuric acid. The contents of the Allihn tube were then transferred to the glass-stoppered flask in which the reduction was carried out; this is done by placing the tube in the flask in the reversed position, and by means of a glass tube pushing the asbestos pad with the mercury into the flask and washing out with distilled water. After making strongly acid with sulphuric acid a considerable excess of potassium permanganate is added, and the whole vigorously shaken until no undissolved mercury remains at the bottom of the flask. As soon as all the mercury has dissolved, an amount of oxalic acid, almost equivalent to the permanganate, is run in, the liquid warmed to about  $50^{\circ}$  and then titrated back with potassium permanganate. Instead of formaldehyde, potassium arsenite was used as a reducing agent in later experiments, the solution, after warming for some time on the water bath, being filtered, and the process conducted as described for formaldehyde.

The results are equally good with both processes, but the arsenite method is preferable because the mercury is more easily washed and more quickly dissolved by the permanganate solution.

**Precipitation Analysis.**—This method is founded on that introduced by Volhard and improved by Rupp and Krauss. Mercury



in nitric acid solution is titrated with ammonium sulphocyanide in the presence of iron alum as indicator, 1 Cc. of decinormal ammonium sulphocyanide solution being equal to 0.0108 Gm. HgO. The method is carried out as follows:

An exact weight of mercuric oxide is dissolved in concentrated nitric acid, about 3 Cc. of a cold saturated solution of iron alum added, and the liquid then titrated with ammonium sulphocyanide solution until a faint brownish red color appears.

Examples are given of each method, showing the results obtained. The mercuric oxide used assayed 99.95% by the sulphide method. —Trans. Br. Phar. Conf. (Yearbook of Pharmacy), 1913, 568-573.

**Corrosive Sublimate.**—*Quick Method of Determination in Antiseptic Cotton and Gauze.*—Dulière recommends a quick method for the determination of corrosive sublimate in antiseptic cotton and gauzes, which is based upon the property of corrosive sublimate to form a precipitate of mercuric iodide with potassium iodide which redissolves on addition of an excess of the precipitant. For comparison a solution of 5.0 Gm. of corrosive sublimate and 5.0 Gm. of sodium chloride in water to make 1 liter, and a solution of 13.5 Gm. of potassium iodide in water to make 1 liter, are prepared; then to 10 Cc. of the corrosive sublimate solution sufficient potassium iodide solution is added, until the precipitate of mercuric iodide formed is redissolved, the number of Cc. of potassium iodide solution required is noted, and sufficient water is added to the latter so that the volume required for the solution of the precipitate is the same as that of the corrosive sublimate solution employed. If, for example, 9 Cc. of potassium iodide solution are required, 900 Cc. of the solution are diluted to 1000 Cc. and 1 Cc. of this solution will correspond to 5.0 Mgm. of corrosive sublimate.

The estimation of corrosive sublimate is then carried out as follows:—10 Gm. of the carefully shredded cotton or gauze is saturated with 15 Cc. of water in a mortar and with continued malaxation of the material the standardized potassium iodide solution is slowly allowed to flow from a burette until the red color at first produced disappears completely. The number of Cc. required, multiplied by 0.005, then gives the weight of the corrosive sublimate in the sample. Pharm. Ztg., lviii (1913), No. 13, 130; from Ann. de pharm. de Louvain.

**Mercury.**—*Its Elimination.* Animal experiments show that the path of elimination for mercury is not solely by way of the kidneys, the bowel may also participate in the excretory function, quite in

harmony with what is observed in the case of various other elements.—J. Am. M. Assoc., v. 60, 1708-1709. (M. I. W.)

**Corrosive Mercuric Chloride.**—*Regulating the Sale.*—A News Note announces that the Department of Health of New York City has placed a restriction on the sale of bichloride of mercury. The amendment of the Sanitary Code which has been adopted reads as follows: "Bichloride of mercury, otherwise known as corrosive sublimate, shall not be held, kept, sold or offered for sale at retail in the dry form except in colored tablets individually wrapped, the wrapper to have the word 'poison' in plain letters conspicuously placed, and dispensed in sealed containers of glass, conspicuously labeled with the word 'poison' in red letters." This ruling does not apply to tablets containing one-tenth of a grain or less of the drug.—J. Am. M. Assoc., 1913, v. 61, 2251. (M. I. W.)

**Mercuric Bichloride.**—*Danger of Tablets.*—The dangers of popularizing tablets of mercuric chloride by them selling under catchy or inferentially misleading names is pointed out and the desirability of including in the Pharmacopœia general requirements for tablets of this kind is discussed. Theoretically, the United States Pharmacopœia should be a work potent for much good but unfortunately its preparation at least in recent years has been dominated by the commercial pharmaceutical interests to such an extent that neither the interests nor the wishes of the public or the medical profession have received much consideration. It would seem highly desirable that steps be taken to insure in future revisions of the Pharmacopœia greater efforts for conserving the health and welfare of the public.—J. Am. M. Assoc., v. 60, 1083. (M. I. W.)

**Bichloride of Mercury.**—*Use by Suicides.*—A recent case of accidental poisoning from bichloride of mercury was so featured in the daily papers as to lead the public to infer that corrosive sublimate poisoning is not only a sure, but painless route to the other world. In view of the misleading nature of this information it would be desirable that the public should be acquainted with the fact that there are but few modes of suicide more painful and in which the agony is longer drawn out than that due to the taking of bichloride of mercury. If this fact were given the same publicity that was accorded the case of accidental poisoning, there is little doubt that the corrosive sublimate method of self-destruction would cease to be the fatal fad it has recently become.—J. Am. M. Assoc., 1913, v. 61, 606. (M. I. W.)

**Corrosive Sublimate Poisoning.**—*Method of Treatment.* Such poisons as arsenic and mercuric chloride sometimes act very rapidly. Thus arsenic has been fatal in twenty minutes and mercuric chloride at the end of half an hour. It is probable that the fatal mischief would be likely to have occurred before a patient could be made ready for operation. The first thing to do in a case of poisoning, if possible, is to give an antidote; the next is to empty the stomach. In corrosive sublimate poisoning the antidote is white of egg, which should be given in not too great quantities since an excess may redissolve the precipitate at first formed. As soon as the antidote has been given the stomach should be emptied, preferably by the stomach tube. In case the stomach tube is not available copious draughts of milk containing emetics should be given. Dr. W. H. Allen, Ph.G., Detroit, suggests as an antidote for poisoning by swallowing bichloride tablets, the use of hydrogen sulphide or sodium sulphide, which will result in the formation of black mercuric sulphide which is insoluble in hydrochloric acid. — J. Am. M. Assoc., v. 60, 2061. (M. I. W.)

## ARSENIC.

**Arsenic.**—*Method of Estimation in Zinc.* S. Crook gives the details of a method and manipulation recommended by him for the estimation of arsenic in zinc:—Granulate the sample through a 24-hole sieve, being careful not to introduce arsenic during this operation. Fit up a Marsh apparatus with a  $\frac{1}{2}$ -inch glass tube containing a roll of lead acetate paper and about 6 inches of fused calcium chloride broken to the size of sweet pea seed, and also a mirror-tube. The hole of the inlet tap of apparatus should be about  $\frac{1}{8}$  inch in diameter. Place 20 Gm. of arsenic-free zinc in the apparatus, and add 30 Cc. of recently boiled and cooled dilute sulphuric acid, which must also be arsenic-free. Acid of suitable strength can be made by adding four parts of water to one part of sulphuric acid. Test issuing gas for oxygen, and when free and action has nearly ceased in flask drop 0.5 Gm. of the sample into the Marsh thistle funnel, into which about 20 Cc. of recently boiled and cooled distilled water had been previously poured. Put out hydrogen flame, and place a small lighted Bunsen burner beneath center of mirror-tube, and when the tube is nearly red-hot place the thumb over outlet of mirror-tube to cause a gentle back pressure. Now carefully open the tap of thistle funnel, and when whole of sample has fallen into flask immediately shut off tap. Remove thumb from outlet, and re-light hydrogen. Practically no water will enter flask, but it will prevent the admission of the slightest



trace of air. Draw the water out of funnel with a pipette and replace it with 30 Cc. of dilute sulphuric acid as before. Open tap and allow sufficient acid to run in to keep the flame not more than  $\frac{1}{4}$  inch in height. Continue the reaction for half an hour, remove burner, allow tube to cool, and compare mirror obtained with a set of standard mirrors previously prepared. Suitable mirror-tubes can be made out of  $\frac{1}{4}$ -inch Jena tubing, and should be about 8 inches long. Suitable standards are  $\frac{1}{5}$  Mgm.,  $\frac{1}{10}$  Mgm. and  $\frac{1}{20}$  Mgm., but it is better to arrange weight of sample to give not more than  $\frac{1}{10}$  Mgm.--Chem. News, March 28, 1913, 149.

**Arsenic.**—*Modification of Bettendorf's Reagent and Test.*--L. Winkler says that Bettendorf's reagent is most suitably prepared in the following way:-- 100 Gm. of clear unchanged crystals of stannous chloride,  $\text{SnCl}_2 \cdot 2\text{H}_2\text{O}$ , is dissolved in sufficient commercial concentrated hydrochloric acid to produce 1 liter of solution. The solution after standing for a day usually develops a faint brown color, due to the traces of arsenic present in the acid. After longer standing the arsenic settles to the bottom in brown flocks, leaving the liquid colorless. The deposition is hastened by keeping in a warm place or by shaking with powdered glass. The glass settles slowly, carrying the precipitate down with it, and after standing for a few days the clear colorless supernatant liquid can be decanted off. It forms then a perfectly clear fuming liquid of specific gravity 1.24-1.25. It should be kept in small stoppered bottles. In testing for arsenic 2 Cc. of the solution for examination, prepared usually with hydrochloric acid, are mixed with 10 Cc. of the reagent, heated to boiling and set aside for half an hour. In the opinion of the author the addition of sulphuric acid is advantageous on account of its dehydrating action. In testing concentrated sulphuric acid for arsenic 1 Cc. is diluted with an equal volume of water and treated with 10 Cc. of reagent. It is stated in the technical literature that heat must be avoided when sulphuric acid is present because reduction to hydrogen sulphide may take place, followed by precipitation of stannous sulphide, but the author shows that heat may be applied without affecting the accuracy of the test. In all cases excess of reagent must be used or the test may fail. The reaction is well marked with a solution of 0.01 Gm. of arsenous oxide in a liter of hydrochloric acid, but the limit of sensitiveness is reached at a dilution of 0.001 Gm. per liter. Pharm. Journ. and Pharmacist, May 17, 1913, 699.



**Arsenic.**—*Improved Test.*—A. F. Judd suggests the following: From the generator of the Marsh apparatus the hydrogen is conveyed to a 100 Cc. Erlenmeyer flask containing 50 Cc. of alkaline solution of lead acetate and thence into a similar flask containing 50 Cc. of silver nitrate (centinormal). The presence of very trifling amounts of arsenic in the generator is shown by pronounced precipitation in the silver nitrate solution. If this method is as reliable as it appears, he says, it gives a qualitative method which is both simple and easy, inasmuch as it does not require the same amount of attention that the Marsh test requires. It also lacks the danger of explosion and injury attendant upon that test.—Proc. Penn. Phar. Assn., 1913, 337-339. (E. C. M.)

**Arsenic.**—*Assay in Blood and Urine.*—Dr. F. Lehmann continues the work reported by Rupp and Lehmann in 1912 (Journ. A. Ph. A., 1912, 309), this time discussing quantitative detection of arsenic in the blood and urine. He treats 500 Cc. urine with 2.5 Gm. powdered potassium permanganate cautiously heating mixture (paraffin added to prevent frothing) until evaporated to dryness. The residue is treated with 5 Gm. permanganate and 10 Cc. diluted sulphuric acid and after 3 to 5 minutes of stirring 20 Cc. of concentrated sulphuric acid is added. After evolution of gas has ceased, 30 Cc. 3% hydrogen dioxide is added and the mixture is heated to boiling to drive off free chlorine. The hot solution is then transferred to a Kjeldahl flask, is washed down with 30 Cc. concentrated sulphuric acid, 5 Gm. exsiccated ferrous sulphate added, the mixture cooled and after adding 50 Gm. sodium chloride the mixture is distilled from a sand bath (using a Stutzer distilling trap) into a liter Erlenmeyer flask, which contains 100 Cc. water and 40 Gm. sodium bicarbonate. On completion of the distillation, the distillate (which must be alkaline) is titrated with N/10 or N/100 iodine V. S., starch paste being used as indicator. 1 Cc. N/10 iodine V. S. = 0.00495 Gm.  $As_2O_3$  and 0.05 Cc. N/10 iodine V. S. must be subtracted, as indicated by blank assays that were run.

As to blood, 25 to 50 Gm. of this is mixed in Kjeldahl flask with 2.5 Gm. finely powdered permanganate. After 10 minutes of shaking, 60 Cc. concentrated sulphuric acid is added and after cooling, 10 Gm. permanganate is added in small portions, keeping flask cooled with water during operation. Then is added 30 Cc. 3% hydrogen dioxide, 7.5 Gm. exsiccated ferrous sulphate, 50 Gm. sodium chloride and 3-5 Gm. olive oil (latter to prevent lumping) and the mixture distilled and further treated as described above under urine.—Arch. d. Pharm., 251 (1913), No. 1, 1. (H. V. A.)

**Arsenous Acid.**—*Combination with Beryllium.*—After describing the conflicting views published as to constitution of an aqueous solution of arsenic trioxide and equally unsatisfactory explanations of the composition of arsenites, Bleyer and Mueller describe their work on the problem as studied from the behavior of arsenic trioxide with beryllium. This work shows that the problem lies within the field of colloidal chemistry and after giving the mathematical side of Henry's law, they report results of their study of the absorption of different quantities of arsenic trioxide by different quantities of beryllium hydroxide. Their figures lead them to the conclusions that a definite chemical, beryllium arsenite, is not obtained; that the beryllium magma (beryllium hydroxide gel, as the colloidal chemists call it) absorbs arsenic trioxide from aqueous solutions and that best when in nascent state; that the absorption at room temperature follows Freundlich's law of absorption, while at the boiling point the absorption is in accord with Henry's law.—Arch. d. Pharm., 251 (1913), No. 4, 304. (H. V. A.)

#### ANTIMONY.

**Antimony in Medieval Medicine.**—*Historical Review.*—A historical review by Ekert cites the use of black antimony by the ancients as cosmetic; the high esteem of antimony by alchemists; the well-known (and now largely discredited) story of Basil Valentine. It then discusses the origin of such antimony preparations as "*pocula emetica*," "*pilule perpetuum*," "*crocus metallorum*," *hepat antimonii*, *oleum antimonii*, *cinnabar antimonii*, *butyrum antimonii*, *fulvis algarothi*, *kermes minerale*, *tartarus stibiatus* and *tinctura antimonii tartarata*. For details, the original must be consulted—Schweiz. Wschr. f. Chem. u. Pharm., 51 (1913), Nos. 14 and 15, 193 and 209. (H. V. A.)

**Antimonium Sulphuratum.**—*Determination of Total Sulphur.*—F. H. Alcock observes that when fuming nitric acid is added to antimonium sulphuratum in determinations of the total sulphur content by the usual method, the action is energetic, and a white residue of  $\text{Sb}_2\text{O}_3$  is obtained. When complete oxidation of the sulphur is thus effected, then comes the difficult problem of filtration. He finds that wash water containing diluted nitric acid, and also solution of ammonium chloride do much to prevent the precipitate passing through a simplex, duplex, or even triplex paper filter, but that even the Gooch filter does not entirely solve the problem. If, however, Rochelle salt is added, the difficulty is obviated. The process, so modified, is carried out as follows:

0.5 Gm. of the sulphurated antimony is placed into a dry 250 Cc. flask with a long neck, 2.5 Gm. of powdered  $\text{KNO}_3$  added, and intimately mixed by shaking; 10 Gm. of Rochelle salt is then added, followed by 25 Cc. or q. s. of fuming  $\text{HNO}_3$ , the flask being then heated very gently on a thin iron plate over the flame of a Bunsen burner, 1 in. long and 1 in. distant from the plate. More acid is added, if required, when no sulphur is visible, and oxidation is complete. Add 25 Cc. of strong  $\text{HCl}$ , and evaporate to get rid of  $\text{HNO}_3$ ; then dilute with water to 250 Cc. Filter off an aliquot part, and proceed as usual. The addition of a little ammonium hydroxide, forming some ammonium chloride, helps to granulate the precipitated  $\text{BaSO}_4$ , and aids its rapid filtration and washing.—Pharm. Journ. and Pharmacist, August 2, 1913, 213.

## BISMUTH.

**Bismuth Subnitrate.**—*Detection of Small Quantities of Lead.*—

G. Guérin recommends the following method for the detection of small quantities of lead in bismuth subnitrate:—10.0 Gm. of basic bismuth subnitrate are heated in a porcelain dish with 50 Cc. of 5% ammonia solution, stirring with a glass rod, and boiled for 3 minutes. When cool, the liquid is filtered and tested with a few drops of a concentrated solution of neutral potassium chromate. In the presence of lead the characteristic precipitate of lead chromate forms. The same method, somewhat modified, is available for the detection of lead in bismuth subcarbonate.—Pharm. Ztg., lviii (1913), No. 92, 921; from Journ. de Pharm. et Chim. (7th Series), viii (1913), No. 9.

## VANADIUM.

**Vanadium.**—*Place in Medicine.*—A report by the Council on Pharmacy and Chemistry expresses the opinion that if vanadium has a place in medicine, and this there is evidence to indicate, the only way in which its value can be proved will be by the careful and painstaking use of preparations put on the market honestly and free from the bias that is inseparable from proprietaries that are sold under grossly exaggerated claims.—J. Am. M. Assoc., v. 60, 212. (M. I. W.)

## SILVER.

**Colloidal Silver.**—*Preparation.*—According to the German Patent, No. 260,849, Jan. 23, 1912, issued to Christian Keller and Anton Schwarz, this is prepared as follows:—The solution of a silver salt in the presence of glutin in an acid and organic solution.



is reduced by means of formic acid, and the colloidal solution thus obtained is evaporated. The colloidal silver forms brownish black, shining granules, which are soluble in cold water, forming a dark brown solution. The percentage of silver depends upon the quantity of the silver salt which is used. Solutions of this kind of colloidal silver are permanent in the presence of acids, which does not hold good in the solutions of colloidal silver which are prepared with alkaline solutions of albumin.—*Suedd. Ap. Ztg.*, 1913, No. 79. (O. R.)

**Nitrate of Silver Cones.**—*Improved Protection from Breakage.*—According to the investigations of Houbotte the storage of nitrate of silver cones in plant seeds to protect them from breakage, which is frequently practiced, has the effect of gradually blackening them and may occasion a loss of approximately 9 per cent. He proposes therefore to embed the points in an inorganic material, and suggests perfectly clean and dust-free pumice fragments, of small size, which have proven free from this untoward effect.—*Pharm. Ztg.*, lviii (1913), No. 73, 739; from *Gazette méd. de Paris*, 1913, 213.

#### OSMIUM.

**Osmium Dioxide.**—*A Carrier of Hydrogen in Hardening Fatty Acids and Oils.*—F. Lehmann, after discussing the work of K. A. Hoffman concerning oxygen catalysis by use of osmium oxide, reports his own experiments on the solidification (hydrogenation) of the unsaturated fat acids and oils by use of osmium tetroxide, which under the reducing action of fatty acids or oils is converted into hydrated osmium dioxide and this in turn acts as a carrier of hydrogen, converting the unsaturated fatty acids or the oils into solid hydrogenated bodies. The method of procedure is to heat 10 Gm. of oleic acid (or oil) with 0.05 Gm. osmium tetroxide until white fumes are given off freely. The dioxide formed goes into colloidal solution with the acid, forming a clear, dark brown fluid. As this fluid is kept warm with a small flame, hydrogen is passed into the fluid for about one and one-half hours, after which the fluid on cooling solidifies to a light brown mass from which by solution in ether and decolorization of the ethereal fluid with animal charcoal, an almost white fat can be obtained. The paper closes with results obtained when the hydrogenation was continued for different periods; half-hour hydrogenation making a fat melting at 32°; 1½ hour treatment making a fat melting at 39°; while the 39° fat hydrogenated anew gave a fat melting at 45°. *Arch. Pharm.*, 251 (1913), No. 2, 152. (H. V. A.)



# ORGANIC CHEMISTRY

## HYDROCARBONS

**Benzole.** *Use in the Treatment of Leukemia.* Frank Billings states that benzole (benzene not benzin) has recently been used as a drug in the treatment of leukemia, Von Koranya being the first one to employ it thus. He was induced to do so, it is said, because of the result of benzole poisoning on girls working in a factory where benzole was used as a solvent for rubber as a cement in the manufacture of tin cans.—J. Am. M. Assoc., v. 60, 495. (M. I. W.)

**Benzole.**—*Therapeutic Use.*—According to Myers and Jenkins, benzole is a valuable addition to the therapy of leukemia of any kind. Clinical experience is still so scanty that definite conclusion as to its intrinsic value should be held in abeyance. The results of benzole therapy are variable for two reasons: (1) The cases in themselves vary in intensity and in the fundamental pathologic conditions or etiologic factors involved. (2) The results are in some way dependent on the size of the dose of benzole which dose may be either stimulating or depressing to the tissues involved. (Albany Medical Annals, 1913, v. 34, No. 7.)—J. Am. M. Assoc., 1913, v. 61, 509. (M. I. W.)

**Benzol.** *Toxicity and Danger when Administered Internally.*—Barker and Gibbes, speaking of the treatment of leukemia with benzol, emphasize the facts: first, that benzol does possess dangerous toxic properties; second, that its clinical effects are not yet clearly understood, and, third, that the greatest care should be exercised in its administration. A studious regard for the dosage, as thus far determined, a watchfulness for the manifestations of poisoning that are well defined and easily detected, and willingness to employ other measures in conjunction with this drug are means that will serve to give the new treatment a fair trial and prevent its falling into an undeserved disrepute. No patient should be treated by benzol unless he can be kept under continuous close observation. (Bull. Johns Hopkins Hosp., 1913, v. 24, No. 274.)—J. Am. M. Assoc., v. 61, 2272. (M. I. W.)

**Benzole.**—*Administration in Leukemia.* Fossati reports a case of severe splenomedullary leukemia in a young woman. She was unable to bear the large doses of benzole that have been advocated and was therefore given from 20 to 60 drops in capsules.

with occasional suspension of the treatment for a day or so. (Sem. Med. Buenos Ayres, v. 20, No. 37.)—J. Am. M. Assoc., 1913, v. 61, 1946. (M. I. W.)

**Dichlorbenzol.**—*Properties and Uses.*—Dichlorbenzol is a colorless crystalline chemical which evaporates very quickly. The resulting vapors have a pleasant ethereal odor and are harmless for man and higher animals, but are poisonous for insects. It is therefore used as an insecticide, and especially for killing moths. Being very easily volatile the vapors penetrate thoroughly and therefore kill the insects and their larvæ and eggs. Dichlorbenzol does not discolor garments, furs, etc., but it is advisable to place the chemical in paper or bags and not in direct contact with the goods.

Further particulars regarding dichlorbenzol can be found in the article on "Moths" by the editor in "The Practical Druggist" for June, 1913, page 46.—Ph. Zhalle., 1913, No. 19. (O. R.)

**Nitrobenzole.**—*Determination in Peanut Oil.*—H. J. Lucas calls attention to the adulteration of peanut oil with nitrobenzole, and gives a method for its determination:

Briefly speaking, a 30-Gm. sample of the oil is weighed into a glass-stoppered flask, 5 Gm. zinc dust added, followed by 10 Cc. concentrated hydrochloric acid, and mixed thoroughly.

After the reduction of the nitrobenzole to anilin has taken place, the liquid is transferred to a separatory funnel, by means of 50 Cc. ether, and 25 Cc. water, the oil-ether mixture is thoroughly washed with 5% hydrochloric acid and the aqueous solution of anilin hydrochloride filtered, after which it is run into 50 Cc. strong sodium hydroxide solution and the separated anilin extracted with several portions of ether.

The combined ether solution is extracted several times with 10% hydrochloric acid, using 4, 3, 2, and 1 Cc. quantities. The acid extractions are evaporated on the water bath in a tared platinum dish, until the mass will just crystallize on cooling, the residue being allowed to dry to constant weight in a soda-lime desiccator (16–35 hrs.).

On ignition at a low red heat, the amount of inorganic material is obtained, which, when subtracted from the total residue, gives the weight of anilin hydrochloride.

Analytical data show 92.2 to 96.3% recovery. Journal Ind. and Eng. Chem., July, 1913, 576. (L. A. B.)

**Nitrobenzol.**—*Toxicity.*—Dr. J. R. Spinner has made an extensive study of the toxicity of nitrobenzol, and has presented the same in a lengthy paper on this subject. Toxic symptoms will appear when nitrobenzol is taken through the mouth, by inhalation, and through absorption by the skin. The poisonous nitrobenzol should not be used in place of oil of bitter almond, and should not be sold under fanciful names and should be labelled "poison." The inhalation of nitrobenzol and its absorption through the skin should be guarded against, especially in chemical factories.—Ph. Zhalle., 1913, No. 35. (O. R.)

**Betanaphthol.**—*A New Reagent for Its Detection in Foods.*—H. Yanagisawa and H. Saito describe a new reagent for the detection of betanaphthol in food products, which depends on the formation of paranitroanilin red, a coloring matter insoluble in water, when the reagent comes in contact with the hydrocarbon. The new reagent is obtained very simply by dissolving about 0.5 Gm. of paranitroanilin in 1 Cc. of hydrochloric acid and 5 Cc. of water by gentle heat, and adding to the solution, when cold, a solution of 0.3 Gm. sodium nitrite in 45 Cc. of ice-cold water, at once, stirring well, and filtering after standing half an hour, if necessary. If a few drops of this reagent are added to a dilute solution of betanaphthol, a scarlet, flocculent precipitate is formed if the quantity of betanaphthol is not too small. In the presence of very small quantities of betanaphthol, no precipitate is produced, the liquid simply assuming a red coloration; but at the end of half an hour, or immediately if a gentle heat is applied, the reaction assumes its characteristic form—the limit of sensitiveness being 1:100,000. It is remarked, however, that the same or similar reactions are produced in the presence of other phenols, such as alphanaphthol, salicylic acid, phenol, thymol, cresol, resorcin, orcein, etc. Pharm. Ztg., lviii (1913), No. 101, 1012; from "Yaku-gakuzasshi" (Journ. of the Pharm. Soc. of Japan), November, 1913.

**Ammonium Sulphichthyolate.** *Precaution in Storage.* M. Heyn calls attention to the liability of material loss by the rusting of the tin cans in which it is commercially supplied, when these are stored, as is frequently done, in the cellar.—Pharm. Ztg., lviii (1913), No. 73, 729.

**Paraffin.**—*Use as a Label Varnish.* C. B. Burnside finds that labels may be made water and acid proof by the application of a saturated solution of solid white paraffin in petroleum ether of boiling point from 40° to 50° C. The process consists in simply

touching the label with a small piece of cotton saturated with the solution. The petroleum ether evaporates almost instantly, leaving an invisible coating of paraffin which retains the new luster of the label as well as making it water and acid proof, and far superior to ordinary label varnish. —*Journ. A. Ph. A.*, May, 1913, 600.

**Liquid Paraffin as a Dressing for Wounds.** —I. C. Chrysospathes has found paraffin oil an effectual dressing for sores of all kinds, and reports that he applied it in treatment of wounds in the Balkan War in 920 cases and the wound healed over in a remarkably short time with a few rare exceptions. Even gaping wounds with exposed bones began to heal at once. The results were even better when he added about 2 per cent. iodoform, in particularly severe suppuration. If the gauze sticks, it can be detached by pouring a little more of the oil on it or hydrogen dioxide. He expatiates on the advantages of this simple method of treatment, which does away with all salves and time-stealing procedures. In some of his cases the temperature dropped to normal each time after application of the paraffin, but rose again when the oil was suspended. He has been using this method for some years, having found it so effectual for sterilizing catheters and healing bed sores. (*Zentralbl. Chir.*, v. 40, No. 45.)—*J. Am. M. Assoc.*, 1913, v. 61, 2201. (M. I. W.)

**Petroleum.** *A Water-Soluble Combination.*—The nearest approach to a water-soluble form of petroleum are combinations with soap in which the hydrocarbon is simply emulsioned and again separates on dilution with water. Max Doenhardt has now found that when petroleum is mixed with the unsaturated tertiary alcohol, "terpineol" ( $C_{10}H_{17}OH$ ), and the solution is treated with triolein and caustic potash solution, the mixture becomes spontaneously strongly heated on stirring and a product results after a short time which forms a perfectly clear solution with alcohol, and this, in turn, may be diluted with water to form a permanently clear solution. In place of olein, other fixed oils may be employed, those rich in glycerin-oleic acid esters being the most suitable, while drying oils and fats require a longer time for the reaction. The proportions of ingredients depend on the quantity of petroleum to be rendered soluble, an excess of potash solution being required in all cases. The author has applied for a patent for this water-soluble form of petroleum, which he has named



"Terpipetrol," and expects to exploit as a bactericide and parasiticide for the effective treatment of infested plants.—Pharm. Ztg., lviii (1913), No. 27, 266.

**Retene-quinone.**—*Condensation with Ketones.*—Heiduschka and Khudadad, continuing the work of the former on retene, have studied its condensation products. Of course, as far as retene-quinone is concerned, the condensation occurs with its two carbonyl groups, but the methods of attachment of the ketene occurs in several ways. Thus a ketone like  $\text{CH}_3\text{CH}_2\text{COCH}_3$  can become attached to either one or both of the carbonyl carbon atoms of the quinone and that by either the methyl or the methylene carbon atom. The following preparations were prepared and analyzed:

1. **Anhydro-acetone-retene-quinone** (oxy-keto-methyl-isopropyl-biphenylene-dihydro-pentene),  $\text{C}_{21}\text{H}_{20}\text{O}_2$ , obtained by condensing retene-quinone with acetone by use of 25 per cent. aqueous potassium hydroxide solution. Silky needles melting at  $206.5^\circ$ . The same body was obtained when alcoholic potassium hydroxide was used as the condensing agent.

2. **Keto-methyl-isopropyl-biphenylene-dihydro-pentene**,  $\text{C}_{21}\text{H}_{20}\text{O}$ , obtained by reduction of "1" with zinc dust and acetic acid.

3. **Oxy-keto-benzylidene-methyl-isopropyl-biphenylene-dihydro-pentan**,  $\text{C}_{28}\text{H}_{26}\text{O}_2$ , made by treating anhydro-acetone-retene-quinone with benzaldehyde in the presence of alcoholic potassium hydroxide. Light yellow glistening needles melting at  $203^\circ\text{C}$ .

4. **Methyl-anhydro-acetone-retene-quinone** (oxy-keto-dimethyl-isopropyl-biphenylene-dihydro-pentene),  $\text{C}_{22}\text{H}_{22}\text{O}_2$ , made by treating retene-quinone with methyl-ethyl-ketone in the presence of 25 per cent. potassium hydroxide solution. White needles melting at  $205^\circ\text{C}$ .

5. **Diketo-methyl-isopropyl-biphenylene-hexene**,  $\text{C}_{22}\text{H}_{22}\text{O}_2$ , made by treating retene-quinone with methyl-ethyl-ketone in the presence of 0.5 per cent. alcoholic potassium hydroxide. Colorless crystals melting at  $196^\circ\text{--}197^\circ$ .

6. **Keto-dimethyl-isopropyl-biphenylene-dihydro-pentene**,  $\text{C}_{22}\text{H}_{22}\text{O}$ , obtained by reduction of methyl-anhydro-quinone with zinc dust and glacial acetic acid or with hydriodic acid (sp. gr. 1.96). Colorless glistening needles melting at  $153^\circ\text{--}155^\circ\text{C}$ .

7. **Keto-methyl-iso-propyl-biphenylene-pentamethylene**,  $C_{22}H_{24}O$ , made by reduction of retene-quinone with zinc dust and hydrochloric acid. Reddish crystals melting at  $192^{\circ}$ – $193^{\circ}$  C.

8. **Oxy-keto-dimethyl-dibrom-isopropyl-biphenylene-pentamethylene**,  $C_{22}H_{22}O_2Br_2$ , made by treating methyl-anhydro-acetone-retene-quinone with bromine. Colorless glistening needles darkening at  $145^{\circ}$  and not completely melting until the temperature of  $195^{\circ}$  C. is attained.

9. **Ethyl-anhydro-acetone-retene-quinone** (oxy-keto-ethyl-methyl-isopropyl-biphenylene-dihydro-pentene),  $C_{23}H_{24}O_2$ , made by treating retene-quinone with methyl-propyl-ketone in the presence of 25 per cent. aqueous potassium hydroxide solution. Fine, colorless needles melting at  $186^{\circ}$ – $187^{\circ}$ .

10. **Amyl-anhydro-acetone-retene-quinone** (oxy-keto-amyl-methyl-isopropyl-biphenylene-dihydro-pentene),  $C_{26}H_{30}O_2$ , made by treating retene-quinone with methyl-hexyl-ketone in aqueous potassium hydroxide solution, or better by use of 0.5 per cent. alcoholic potassa. Fine, colorless needles melting at  $181^{\circ}$ – $182^{\circ}$ .

11. **Oxy-keto-dimethyl-butenyl-isopropyl-biphenylene-dihydro-pentene**,  $C_{26}H_{28}O_2$ , made by condensing retene-quinone with methyl-heptanon in alkaline solution. Fine, colorless needles melting at  $213^{\circ}$ – $214^{\circ}$  C.

12. **Iso-propylidene-anhydro-acetone-retene-quinone**,  $C_{24}H_{24}O_2$ , made by treating retene-quinone with methyl-isobutyl-ketone in the presence of 0.5 per cent. alcoholic potassa. Yellowish white needles melting at  $217^{\circ}$ – $219^{\circ}$ .

13. **Diacetyl-diphenyl-methyl-isopropyl-biphenylene-butadiene**,  $C_{28}H_{32}O_2$ , obtained by treating retene-quinone with phenyl-acetone in the presence of 25 per cent. aqueous potassium hydroxide solution. Reddish crystals melting at  $198^{\circ}$ – $202^{\circ}$ .

14. In addition to this body, another substance,  $C_{45}H_{40}O_2$ , was obtained in the form of reddish needles melting at  $214^{\circ}$  to  $215^{\circ}$  on the first recrystallization of the crude product "12"; while from the mother liquid remaining after separation of crude crystal mixture "12" and "13" was obtained a third body,

15. **Anhydro-phenyl-acetone-retene-quinone-acetate**,  $C_{29}H_{26}O_3$ , in colorless needles melting at  $210^{\circ}$  to  $212^{\circ}$ . This body

was also obtained when retene-quinone and phenyl-acetone were combined under the influence of piperidine as a condensing agent. When alcoholic potassium hydroxide was used as the condensing agent, the product obtained was

16. **Phenyl-acetone-retene-quinone** (oxy-diketo-methyl-isopropyl-biphenylene-phenylpentene)  $C_{36}H_{36}O_4$ . This substance—bright yellow crystals melting at  $190^{\circ}$ – $192^{\circ}$ —when treated with glacial acetic acid yielded a small quantity of impure anhydro-phenyl-acetone-retene-quinone acetate (No. 14).

17. **Oxy-keto-methyl-isopropyl-biphenylene-dihydro-pentene-dicarbonic-acid-diethyl ester**,  $C_{27}H_{28}O_6$ , made by condensation of retene-quinone with the diethyl ester of acetone-dicarbonic acid in the presence of 0.5 per cent. alcoholic potassa. Fine yellow needles, melting at  $185^{\circ}$ – $187^{\circ}$ .

18. **Diphenyl-diketo-methyl-isopropyl-biphenylene-hexadiene-dicarbonic-acid-diethyl ester**,  $C_{40}H_{36}O_6$ , made by treating retene-quinone with benzyl acetic ester in the presence of acetic anhydride and a little concentrated sulphuric acid. Fine yellowish needles melting at  $235^{\circ}$  C.—Arch. d. Pharm., 251 (1913), No. 6, 401. (H. V. A.)

**Rubicin.**—*A Red Hydrocarbon.*—This was first prepared by Fittig, by the distillation of diphenic acid with calcium oxide. Pummerer named this hydrocarbon, rubicin and determined its formula as  $C_{26}H_{14}$ . It is a dark red micro-crystalline powder which has a melting point of  $306^{\circ}$  C. It is soluble in chloroform and nitrobenzol, but only sparingly soluble in benzol.—Ber. d. deutsch. chem. Ges., 1912, 45, 294. (O. R.)

**Yellow Vaseline.**—*Irritant Properties not Due to Color.*—According to the investigations of Dr. P. Abel, Staff-Apothecary in the Prussian War Department, the irritant properties occasionally observed when yellow vaselin is used in eye salves is not due to its color, but to other impurities depending on the method of its purification. Pure yellow vaselin, which is readily obtained on the market, is quite as non-irritant as is pure white vaselin. The author however, recommends the correction of the melting point to at most  $37.5^{\circ}$  by the addition of liquid paraffin and that complete fluidity should result at  $35^{\circ}$ .—Pharm. Ztg., lviii (1913), No. 55, 532.

#### VOLATILE OILS AND DERIVATIVES.

**Volatile Oils.**—*Solubility of Water in Them and Its Effects.*—J.

C. Umney and Sidney W. Bunker summarize the conclusions reached by them from the results obtained in a research on "The Solubility of Water in Essential Oils," appearing in a series of articles in "Perfumery and Essential Oil Record."

(1) All oils containing any considerable quantity of oxygenated constituents show a general tendency to increase in specific gravity on keeping. The "terpene" group of oils, being practically free from such constituents, is the only one which shows a consistent and definite decrease in the value of this constant throughout the series.

(2) In those oils in which the combination of conditions produces a change in the direction opposite to that usually met with, such change shows a distinct parallelism in its magnitude, and a certain periodicity in its occurrence, agreeing with the repetition of similar conditions.

(3) The optical rotation of the oils, with two trifling exceptions, shows a marked decrease throughout the whole series, a change which would be expected in view of the fundamental cause of this property. In some cases it is interesting to note that the oils stored in the dark show the least decrease in rotation.

(4) The refractive index cannot be made the subject of any general rule as to the direction of its changes, but there is evidence of a phenomenon which it is believed has not been observed before. The lowest figure for, or the greatest decrease in, the refractive index of the oils, is almost constantly found in those conditions in which the oil is stored in the dark, and especially when it is also a "dry" oil. That is to say, storage in the dark either favors the production of bodies of a low refractive index, or else such storage results in what may be called a "decay" of the refractive property. If this hypothesis could be verified in a wider field of work, it would be a matter of immense interest to the physicist, as no record of such a "decay" is usually met with.

(5) The magnitude and direction of the change in the percentage of the chief constituent has already been dealt with under each group, but it may be stated that, in general, a dry condition is most favorable in this respect.—Chem. and Drugg., March 22, 1913, 450.

**Volatile Oils.**—*Estimation of Glyceryl Acetate.*—According to S. G. Hall and A. J. Harvey, glyceryl acetate may be conveniently and reliably estimated by the following process devised by them:—Ten grams (not less) of the oil to be examined is mixed with about 50 Cc. of 0.830 alcohol and saponified with N/2 alcoholic



potash; it is then digested on the water bath for an hour, neutralized by N/2 hydrochloric acid, and evaporated to dryness on the water bath; about 20 Cc. of water is added, and the oily portion extracted by methylated ether, the aqueous solution being run into a 6 oz. round-bottomed flask, the ether extract is again washed with a further quantity of about 10 Cc. of water, which is then added to that already in the flask, and the whole evaporated to a syrup. The residue contains the glycerol originally present as glyceryl acetate, which is estimated in the usual way by the triacetin method, the amount of glyceryl acetate being calculated therefrom. —Pharm. Journ. and Pharmacist, Jan. 25, 1913, 96; from *Perfum. and Essent. Oil Record*, Jan., 1913.

**Egyptian Perfumes.**—Dr. L. Reutter publishes an historical paper on this subject, giving uses of perfumes by the ancient Egyptians in their worship, their embalming and in their toilet. He gives recipes of such perfumes, resinous masses found in Egyptian homes, temples and tombs, showing that these usually consist of storax, frankincense, turpentine, sugar (presumably from palm wine or from raisins) and extract of henna. He shows that they sometimes contain myrrh, mastic, bdellium, opopanax and bitumin of Judea; but that none of those he has examined contain sandarac, Gurjun balsam, asafetida, ammoniac, galbanum, sagapen nor aloes. The paper contains methods employed in detecting each of these substances, especially when dealing with very small samples.—*Schweiz. Wschr. f. Chem. u. Pharm.*, 51 (1913), Nos. 22, 23, 24 and 25; 323, 334, 353 and 369. (H. V. A.)

**Terpeneless and Sesquiterpeneless Oils.**—*Relative Advantages over the Normal Oils.*—Ernest J. Parry says that the use of oils deprived of their terpenes has now become very extended. The advantages claimed for such terpeneless oil are principally the facts that, generally speaking, oxygenated compounds of essential oils are more soluble than the terpenes, and therefore a considerable saving in alcohol as a solvent becomes possible; also that the terpenes are practically flavorless, and are far more prone to decomposition than the oxygenated constituents. This is substantially true in cases where the oil contains a large amount of terpenes, as in the case of orange and lemon oils; but it is doubtful whether oils containing very delicate esters, such as bergamot oil, are improved by being rendered terpeneless.

Dealing particularly with lemon oil in this note, Mr. Parry observes that it has been suggested in recent years to remove not

only the terpenes from lemon oil, but also the sesquiterpenes, the resulting oil being described as

**Sesquiterpeneless Lemon Oil**, it being understood that the term "sesquiterpeneless" includes the term "terpeneless." During the past two years the author has had occasion to examine numerous samples of both classes of oil, the principal chemical difference to be noted being that normal oils from which the terpenes only have been removed contain somewhere in the neighborhood of 42 to 45 per cent. of citral, whereas oils from which the sesquiterpenes have also been removed contain a higher amount of citral, which may reach 65 per cent., or, as claimed by some makers, 72 per cent. He has examined samples containing high percentages of citral which were claimed to be sesquiterpeneless, but which were, in fact, ordinary terpeneless oil to which lemongrass citral had been added. Hence very high percentages of citral must be carefully considered from this point of view. In dealing with genuine sesquiterpeneless oils containing, say, 65 per cent. of citral, there is one point which cannot fail to be apparent to any impartial observer of experience—namely, that the oil has usually lost the sweetness and softness of a well-prepared terpeneless oil, the overpowering smell of so much citral destroying the balance of harmony in the odor of the oil containing about 45 per cent. of citral. Indeed, the author has known experienced users to say that the best results are obtained with an oil containing under 40 per cent. of citral, from which the whole of the terpenes have not been removed. Most samples of "terpeneless" lemon oil do, in fact, contain very small quantities of terpenes.

**Pure Terpeneless Lemon Oils** which Mr. Parry has examined—that is, samples containing not more, and usually less, than 5% of terpenes—have had the following characters:

Specific gravity at 15° C.....	0.8935 to 0.899
Optical rotation.....	—5° to —8° 30'
Refractive index.....	about 1.4810
Citral value.....	42 to 48 per cent.

Any undue amount of terpenes is indicated by a much decreased solubility, a lower specific gravity, a lower lævorotation, or the oil becomes dextrorotatory, and on fractionation under diminished pressure the early fractions show a high dextrorotation.

**Pure Sesquiterpeneless Oils** containing no sesquiterpenes at all, or those from which almost all the sesquiterpenes have been re-

moved, have, so far as the author's experience goes, the following characters:

Specific gravity.....	0.898 to 0.902
Optical rotation.....	+1° to -3° 45'

The citral value is very variable, but in cases where the whole of the sesquiterpenes have been removed it averages about 65 per cent., or possibly a little higher. Where the concentration has not been carried quite so far the citral value is, naturally, lower; and although the latter oil is, in his opinion, less strong than the former, it is far more sweet, but neither so delicate in flavor nor aroma as ordinary well-prepared terpeneless oil.—Chem. and Drugg., Sept. 6, 1913, 378.

**Synthetic Perfumery Products.**—*Description.*—G. W. Gaskill describes the synthetic manufacture of flower oils and other chemical substances which enter into the composition of the perfumes of the market. Synthetics, he says, are responsible for the modern perfumery of the present day. The best illustration of the point is to compare the rose odors of this day with those of a decade ago when they were made from natural products. With the materials at hand now one can compound any kind of rose odor desired. Compare the red rose odor with that of the old, or for that matter, some of the finest rose products to be had with those of the old, and the comparison is a sad one for natural products. In the old days the perfumer had to readjust his formulas from season to season for the reason that the natural products were never uniform in odor value, a dry season producing certain results in the economic life of that particular plant, and a wet season producing still another; the kind and method of fertilizer used having still another effect. Not so with synthetic products: they are always uniform in odor value and price.—Proc. Cal. Phar. Assn., 1913, 71-74. (E. C. M.)

**Oil of *Acronychia Laurifolia*.**—*Constants.*—At Buitenzorg a volatile oil has been distilled from the leaves of *Acronychia laurifolia* in a yield of 0.06%. The constants of the oil were as follows: Sp. gr. 27°, 0.909; opt. rot., +9° 4'; acid val., 0.8; sap. val., 14. —Schimmel's Semi-Ann. Rep., October, 1913, 19; from "Jaarb. dep. Landb. in Ned.-Indie," Batavia, 1911, 47.

**Oil of *Alpinia Alba*.**—*Characters and Components.*—S. S. Pickles and J. C. Earl have distilled from the fruits of *Alpinia alba*, Rose., in a yield of about 1%, a pale yellow oil having an odor reminding



of lemon and of eucalyptus oil; sp. gr., 0.9366; opt. rot.,  $-2^{\circ} 15'$ . The oil contained 69% of cineol, 27.5% of aldehydes and ketones (principally citral), 1% of acids (including a solid acid with m. p.  $46^{\circ}$  to  $48^{\circ}$ ) and possibly 1% of terpenes.—Schimmel's Semi-Ann. Rep., October, 1913, 21; from Proc. Chem. Soc., 29 (1913), 164.

**Oil of *Alpinia Malaccensis*.**—*Characters and Constituents.*—The volatile oil of the leaves of *Alpinia malaccensis* has been distilled at Buitenzorg in a yield of 0.16%; it had the sp. gr. at  $26^{\circ}$  of 1.03, and a sap. val. of 282.8. Allo-cinnamic acid was identified in the saponification product from the aniline salt. The same oil had been distilled in 1900 by van Romburgh, who obtained it in a similar yield.—Schimmel's Semi-Ann. Rep., October, 1913, 21.

**Oil of *Angelica Root*.**—*Constituents Found in the Distillation Waters.*—From the collected first runnings of several samples of the distillation waters of angelica root, Schimmel & Co. separated a yellow liquid having a slightly acrid odor and consisting principally of a large proportion of methyl alcohol and a little ethyl alcohol. Further examination of this liquid revealed also the presence of furfural, of diacetyl, and of a base which has not yet been definitely identified. It is regarded possible that the ethyl alcohol is generated from the green parts of the plant during the storage of the roots.—Schimmel's Semi-Ann. Rep., April, 1913, 26.

**Oil of *Angostura Bark*.**—*Yield, Characters and Constants.*—Very little is known in regard to the constants of angostura bark oil because this oil is rarely distilled. Schimmel & Co. have recently obtained this volatile oil by steam distillation from material which was botanically determined to be the bark of *Cusparia trifoliata*, Engl., in a yield of 1.03%. The oil was pale brown and even in 90% alcohol (9 vols.) it only gave a turbid solution; sp. gr. at  $15^{\circ}$ , 0.9285; opt. rot.,  $-7^{\circ} 32'$ ; refr. index  $20^{\circ}$ , 1.50744; acid val., 1.8; ester val., 5.5; ester val. after acetyl., 35.7.—Schimmel's Semi-Ann. Rep., April, 1913, 26.

**Apple Oil.**—*Preparation from Apple Peel.*—In a previous experiment, C. Thomas obtained from apple peel, by sprinkling with dilute soda solution and extraction with ether, an oily product consisting of two fractions, one having a high melting point, the other a low melting point. The first fraction has not yet been examined; the second fraction, which can be separated by treatment with cold ether, is a waxy substance. In another experiment green apple peel, without the addition of soda solution, was



extracted for two days with ether at room temperature. From the evaporated ether a crystalline substance separated out which was filtered off. When the filtrate was afterwards evaporated *in vacuo*, a dusty mass sublimed out, which melted under the warmth of the hand and had a pleasant odor of apples. At an increased temperature a thick, yellow oil passed over which crystallized immediately. In a third experiment, by distillation, without water, in a vacuum at 150°, oily drops having an agreeable perfume were obtained, and at 180°, a white sublimate was produced, consisting chiefly of wax, but possessing an exquisite odor of flowers.—Schimmel's Semi-Ann. Rep., April, 1913, 28; from Journ. f. prakt. Chem., II, 87 (1913), 142.

**Arnica Oils.**—*Distillates from Roots and from Flowers.*—In the course of the last few years, Schimmel & Co. have prepared distillates from arnica roots and from arnica flowers which has given them opportunity to make further observations with regard to the limits of value of the separate constants of these oils. The result was as follows:

**Oil of Arnica Root.**—Sp. gr. 15°, 0.984 to 1.00; opt. rot., +0° 15' to -2°; refr. index 20°, 1.507 to 1.508; acid val., 4 to 10; ester val., 60 to 100; soluble in 7 to 12 vols. of 80% alcohol and in 0.5 to 6 vols. of 90% alcohol—in both cases possibly with turbidity.

**Oil of Arnica Flowers.**—A butter-like mass, melting to a brownish liquid between 20° to about 30°; sp. gr. 30°, 0.8905 to 0.9029; acid val., 62.6 to 127.3; ester val., 22.7 to 32.2. The oil is very sparingly soluble in alcohol and even with absolute alcohol the solutions are only clear in the beginning. —Schimmel's Semi-Ann. Rep., April, 1913, 28.

**Oil of Indian Artemisia Vulgaris.**—*Characters and Constants.*—A sample of "Indian Wormwood Oil," received from the Indian Museum at Calcutta, and prepared at Lebong in the district of Darjeeling (Bengal) from *Artemisia vulgaris* (A. indica, Willd.), was examined by Schimmel & Co. Its color was yellowish with a greenish fluorescence and its odor that of sage; sp. gr. 15°, 0.9219; opt. rot., -8° 52'; refr. index 20°, 1.46201; acid val., 1.2; ester val., 22.1, and after acetyl., 55.5; soluble in 1 vol. of 80% alcohol, but when more than 5 vols. were added, opalescence ensued and after prolonged standing paraffin crystals separated. The oil contained  $\alpha$ -thujone, which singularly proved to be inactive. It also probably contains borneol.—Schimmel's Semi-Ann. Rep., April, 1913, 28

**Oil of *Atherosperma* Leaves.**—*Constants and Constituents.*—Schimmel & Co. observe that until recently only the oil from the bark of "Australian Sassafras" (*Atherosperma moschatum*, Lab.), a native of Victoria, was described. The oil from the leaves of this plant has only recently been prepared in fairly large quantities by M. E. Scott, who has closely investigated it. The leaves were distilled two or three days after being gathered, and yielded 1.7 to 2.65% of oil. The fractions which passed over first (about 30%) were lighter than water, the others were heavier. The crude product is of a yellowish color and has a clearly perceptible sassafras odor: sp. gr., 1.027; opt. rot., +7° 5'; refr. index, 1.5211. It contained 15 to 20% of *a*-pinene (b. p. 157° to 158°), 15 to 20% of *d*-camphor (m. p. 174.5° to 176°) and 5 to 10% of safrol (b. p. 223°; m. p. 8° to 12°).—Schimmel's Semi-Ann. Rep., April, 1913, 29; from Journ. Chem. Soc., 101 (1912), 1612.

**Oil of Bananas.**—*Amylacetate a Natural Constituent.*—C. Kleber has recently isolated and investigated the odoriferous principle of the banana. For this purpose he allowed an entire bunch of green bananas to ripen thoroughly, peeled the ripe fruit, crushed it, and, from this highly aromatic material, prepared by steam distillation, a few drops of an oil possessing the characteristic odor of the bananas. By saponifying with aqueous soda liquor, he succeeded in splitting up the oil into acetic acid and into a body with a fusel-like odor. The latter he converted from primarily produced valer-aldehyde into valeric acid, by oxidation with permanganate in alkaline solution, and he holds that this investigation proves the occurrence of amylacetate in ripe bananas.

Commenting on this interesting result, Schimmel & Co. observe that although the odor and taste of bananas clearly remind of the ester in question, and although it is well known that the aromatic principle of a variety of fruits can be excellently imitated by the aid of synthetic esters, especially amyl esters, no proof had heretofore been given of the presence of amyl esters in natural products. And this is the more interesting, because the discovery of this ester as a natural constituent has been made in a fruit which is highly esteemed as a food of which the harmless character is universally recognized; whereas amyl acetate and amyl esters in general, which are prepared from fusel oil, are regarded as being injurious to health. But the fact that amyl acetate can be taken in bananas without any danger to the human health shows that the use of small quantities of synthetic amyl esters in essences which serve for the preparation of liquors and aerated waters is

quite innocuous. Moreover, it is quite possible that amyl esters may be found to be among the natural constituents of other fruit, as they are of the banana.—Schimmel's Semi-Ann. Rep., April, 1913, 29.

**Oil of Barosma Venusta.**—*Constants and Constituents.*—H. R. Jensen distilled from the dry leaves of *Barosma venusta*, Eckl. et Zeyh., in a yield of 1.1%, a volatile oil having the following constants: Sp. gr., 0.8839; opt. rot., + 0° 30'; refr. index, 1.4967; acid val., 2.4; sap. val., 13.4 (after acetyl. 52.8); phenol content 16%. The oil contained 35% of a terpene having properties which agreed with those of *myrcene*. In addition, the author assumes the presence of methyl chavicol, the acetate of myrcenol or of an isomeric of myrcenol, chavicol and perhaps an olefinic sesquiterpene.—Pharm. Journ. and Pharm., v. 90 (1913), 60.

**Oil of Sweet Basil.**—*Characters and Constants.*—Roure-Bertrand Fils describes two samples of oil of sweet basil, produced in the island of Mayotte, which had the characteristic odor of sweet basil oil, with the difference that it reminded not only of methyl chavicol but also, and fairly distinctly, of anethol. The constants of the oils were the same as those of Réunion sweet basil oil, viz.: Sp. gr. 15°, 0.9677 and 0.9630; opt. rot., + 0° 58' and + 0° 56'; acid val., 1.4 and 0.7; sap. val., 5.6 and 6.3; soluble in 3.2 vols. of 80% alcohol.—Schimmel's Semi-Ann. Rep., April, 1913, 30.

**Oil of Sweet Basil from Mayotta.**—*Characters.*—Schimmel & Co. have recently had opportunity to examine a sweet basil oil prepared on the island of Mayotta (Comoro Islands) which showed characters which agreed with those of Réunion oil: Sp. gr., 0.9615; opt. rot., + 0° 55'; refr. index, 1.51538; acid val., 0; ester val., 6.2; soluble in 5.5 vols. and more of 80% alcohol. Although the demand for this oil is quite insignificant and is threatened with obsolescence, it is referred to because the origin of this particular oil is of interest.—Schimmel's Semi-Ann. Rep., October, 1913, 27.

**Bay Oil.**—*Contamination with Lead.*—Harold A. Tempany states that on several occasions it has been reported that the distillation of bay oil from bay leaves is accompanied by the production of small and varying amounts of a black greasy substance, which appears in the receiver together with the bay oil and water. It was at first thought that this might be due to accidental contamination with heavy mineral-oil residues, in view of the fact that stills are not infrequently constructed from mineral-oil drums.



and as the explanation did not appear unlikely, systematic distillation trials were made at Montserrat. In these experiments the appearance of small quantities of the black grease was observed with considerable regularity. In spite of precautions to guard against it, the production of small amounts of the material continued. It was then noted that the worm condenser used in the experiments had been constructed locally, and was fitted with a coil made of  $\frac{1}{2}$ -in. lead pipe. Further experiments showed that when pure bay oil was boiled with small pieces of lead for some hours under a reflux condenser, the oil had darkened in color and the pieces of lead had become coated with a film of black grease similar in appearance to that in bay-leaf distillates. Similar experiments were made with strips of copper and tin, but in neither case was the black grease produced. Bay oils normally contain a high percentage of eugenol, and it is suggested that the appearances observed are no doubt due to the contamination of the substance with hydrated lead oxide formed on the interior of the coil by the action of air and steam.—Chem. and Drugg., Sept. 20, 1913, 443.

**Birch Bud Oil.**—*A Readily Soluble Form.*—Owing to the high paraffin content of ordinary birch bud oil it does not give a clear solution with 80% alcohol or even with 90% alcohol. For certain uses, however, it is desirable that the oil should form a clear solution, and such an oil has been produced by Schimmel & Co. by the removal of the paraffin constituent, which they distinguish by the name of "Birch Bud Oil, readily soluble." This forms permanently a clear solution with 80% alcohol in all proportions, and shows the following constants: Sp. gr. 15°, 0.9756; opt. rot.,  $-6^{\circ} 20'$ , refr. index, 20°, 1.50092; acid val., 2.7; ester val., 56.9; and after acetyl., 185.0.—Schimmel's Semi-Ann. Rep., April, 1913, 32.

**Oil of Bitter Almonds.**—*Review of the Characters of the Glucosides and Enzymes Concerned in Its Formation.*—Schimmel & Co., in their spring report (April, 1913), comprehensively review the work done by L. Rosenthaler to clear up the nature of the glucosides and enzymes that are concerned in the production of oil of bitter almonds. The nitrile glucosides which occur in nature have hitherto been described comprehensively as amygdalin; the possibility that, in addition to the ordinary amygdalin, isomerides or stereomerides, as for example *iso*-amygdalin or *neo*-amygdalin, might occur, having simply been disregarded. In order to clear up this matter,



Rosenthaler has prepared the glucosides of the seeds of apricots, peaches, plums, apples and quinces and ascertained the following constants of these: melting point, specific rotation, molecular weight, nitrogen content, and optical rotation of the mandelic acid obtained by the saponification of the glucosides. The result of his investigation showed that all the data agreed with those of amygdalin and that therefore the glucoside contained in the seeds referred to is identical with the amygdalin of bitter almonds.

He has further tested the seeds containing amygdalin (obtained by boiling the seeds, after freeing them from fat, with alcohol) for the presence of glucosides of the type of mandelonitrile glucoside. For this purpose he regards Bourquelot's method, in which any saccharose possibly present is decomposed with invertin, as unsuitable, because, in his view, invertin not only decomposes the cane sugar, but also the amygdalin. But here Rosenthaler is mistaken, as Bourquelot and Hérissé have shown in their rejoinder of his statements. For amygdalin is not affected by invertin at all, but it is affected by amygdalase, a ferment which differs from invertin, and which Bourquelot and Hérissé assume was contained in the yeast employed, the yeast, as is often the case, containing both ferments. For this reason it is necessary in biological experiments such as carried out by Rosenthaler, first to test the yeast for the presence of amygdalase.

In a paper published subsequently, Rosenthaler gives the results of his comprehensive investigations on the distribution of emulsin-like enzymes and mentions an astonishingly large number of plants and parts of plants containing such, which he had examined with a view of ascertaining whether they develop similar action as does the almond emulsin; that is to say, whether they decompose amygdalin until hydrocyanic acid appears in the distillate, and whether in synthetical experiments and in the splitting off of nitrile they yield optically active nitriles. From these and other experiments Rosenthaler arrives at conclusions which lead him to indicate the processes which take place in the amygdalin-emulsion system as follows:

I. **Amygdalin**, by the action of amygdalase, affords mandelonitrile glucoside and glucose.

II. **Mandelonitrile Glucoside** is resolved by the action of prunase into *d*-benzaldehyde cyanohydrin and glucose.

III. ***d*-Benzaldehyde Cyanohydrin** is resolved by *d*-oxynitrilase into benzaldehyde and hydrocyanic acid.

IV. **Benzaldehyde and Hydrocyanic Acid** unite under the influence of a *d*-oxynitrilase to form *d*-benzaldehyde cyanohydrin; and in addition, benzaldehyde and hydrocyanic acid afford inactive benzaldehyde cyanohydrin.

V. **Inactive Benzaldehyde Cyanohydrin** is capable of being split up asymmetrically by *d*-oxynitrilase, giving rise to *l*-benzaldehyde cyanohydrin. But in emulsin preparations which are rich in this enzyme it is possible that, as a result, the benzaldehyde cyanohydrin which is formed in the process of the decomposition of amygdalin may be *lævorotatory*.

The reviewers also direct attention to a recent communication of G. Bredig and P. S. Fiske (*Biochem. Ztschr.*, 46 (1912), 7), in which they announce their discovery, that when an optically active alkaloid is used as a catalyzer the generation of benzaldehyde cyanohydrin from its components, hydrocyanic acid and benzaldehyde, takes an optical-asymmetric course; that is to say, that asymmetric synthesis can be achieved by a catalyzer of known constitution exactly in the same manner as by an enzyme.—Schimmel's Semi-Ann. Rep., April, 1913, 20-23.

**Oil of Bupleurum Fruticosum.**—*Constituents.*—L. Francesconi, who a few years ago had (with G. Sanna) determined the presence of an alcoholic constituent in the oil of *Bupleurum fruticosum*, has since more closely examined the alcohol and, in collaboration with E. Sernagitto, by treating the oil with phthalic anhydride, obtained an acid phthalate, from which they prepared an alcohol,  $C_{10}H_{20}O$ , which they have named:

**Bupleurol.**—This is described as an almost colorless oil with a clear but faint odor of rose: b. p.  $209^{\circ}$  to  $210^{\circ}$  (762 Mm.); sp. gr., 0.8490; opt. rot.,  $\pm 0^{\circ}$ ; refr. index, 1.4508. Its dibromide is oily; its acid phthalic ester yielded a silver salt with m. p.  $135^{\circ}$ ; its phenylurethane melts at  $45^{\circ}$ . By oxidation, bupleurol yielded a volatile oil of an agreeable lemon odor, from which, with bisulphite, an aldehyde could be isolated (of which the semicarbazone had the m. p.  $97^{\circ}$ ), as well as a yellowish oily ketone, b. p.  $217^{\circ}$ . Although giving no direct proof of the accuracy of the constitutional formula which the authors assign to bupleurol, they regard it to represent a "dihydronerol." Schimmel's Semi-Ann. Rep., October, 1913, 28; from *Atti R. Accad. dei Lincei*, Roma (5), 22 (1913), 31.

**Camphor Oil.**—*Constituents of the Higher-Boiling Fractions.*—

The higher-boiling portions of camphor oil, in which Schimmel & Co. had a number of years ago detected the presence of cadinene and bisabolene, have been thoroughly investigated by F. W. Semmler and J. Rosenberg, who obtained in addition to bisabolene (the name of which they have changed to "limonene") and cadinene, a fraction containing a sesquiterpene to which the authors give the name *sesquicamphene*, b. p.  $129^{\circ}$  to  $133^{\circ}$  (8 Mm.); sp. gr., 0.9015; optical rot.,  $+3^{\circ}$ ; refr. index, 1.50058. A fraction boiling between  $150^{\circ}$  and  $170^{\circ}$  consisted chiefly of a sesquiterpene alcohol, which they named *sesquicamphenol*: b. p.,  $125^{\circ}$  to  $130^{\circ}$  (7 Mm.); sp. gr., 0.9138; opt. rot.,  $+50^{\circ}$ ; refr. index, 1.50895; and from a fraction boiling between  $180^{\circ}$  and  $190^{\circ}$ , a diterpene ( $C_{20}H_{32}$ ) was obtained, which they have named *a-camphene*.—Schimmel's Semi-Ann. Rep., October, 1913, 35-36; from Berl. Berichte, 46 (1913), 768.

**Camphor Oil.**—A *Distillate from a Hybrid Tree*.—In their Report of April, 1905, Schimmel & Co. described an oil (see Proceedings, 1905, 755) which had been prepared from the leaves of a tree, grown on the grounds of the Villa Rothschild at Cannes, and represented as having been identified as *Laurus camphora*, L. This oil (which is again described) differed, however, wholly in character from true camphor-leaf oil, making it probable that the tree in question belonged to a different species of *Cinnamomum*, and this view was confirmed by a careful botanical examination subsequently made, which established *Cinnamomum glanduliferum*, Meiss. to be the parent plant.

It is a remarkable fact, that while neither the oil, nor another sample received several years later, contained any camphor, Mr. R. S. Pearson, of Dehra Dun, obtained from the leaves of *Cinnamomum glanduliferum* a camphor which was clearly identical with the Japanese product. Schimmel & Co. cannot explain the reason for this difference, but conjecture that in the case of the second oil hybridization may account for it; and this is apparently confirmed by a specimen of oil recently received from Cannes which was the product of a hybrid of *Cinnamomum camphora*, Nees et Eberm. and *Cinnamomum glanduliferum*, Meiss., growing in the garden of the Villa Flora there. This oil constitutes a liquid with a strong admixture of camphor, which resembled Japanese camphor in all respects, but unlike the latter was not associated with safrol. —Schimmel's Semi-Ann. Rep., April, 1913, 41-42.

**Borneo Camphor Oil.**—*Physical Characters and Constituents.*—



The paucity of reliable literary references to the chemical constituents of the volatile oil of the Borneo camphor tree, *Dryobalanops aromatica*, Gärtn., induced Schimmel & Co. to undertake a complete investigation of a Borneo camphor oil derived from Singapore, which presented the following physical characters: A dark brown oil, of sp. gr.  $15^{\circ}$ , 0.9180; opt. rot.,  $+11^{\circ} 5'$ ; refr. index  $20^{\circ}$ , 1.48847; soluble in 5 vols. of 90% alcohol; insoluble in 10 vols. of 80% alcohol. Its odor resembled that of turpentine, at the same time reminding of borneol. The analytical results, which are described in detail, indicate the following constituents: about 35% of terpenes, consisting of *d*- $\alpha$ -pinene, camphene,  $\beta$ -pinene, and dipentene; about 10% alcoholic constituents, borneol and  $\alpha$ -terpineol (m. p.  $35^{\circ}$ ); about 20% sesquiterpenes, and approximately 35% of resin.—Schimmel's Semi-Ann. Rep., April, 1913, 32-34.

**Malay Camphor Oil.**—*Characters and Constituents.*—Referring to an article by Eaton on the cultivation of the camphor tree in the Federated Malay States, quoted in their October Report of last year (see Year Book, 1912, 327), Schimmel & Co. mention that they have now the opportunity to report on a sample of camphor oil produced in that country and described in the Bulletin of the Imperial Institute. The oil constituted a pale yellow liquid, studded with crystals and possessing a mild odor of camphor. By cooling to  $-10^{\circ}$  the sample yielded 19.3% of camphor. After being freed from camphor the oil possessed the following constants: Sp. gr., 0.913; opt. rot.,  $41^{\circ} 1'$ ; contained no safrol, which is explained by the fact that it had been distilled from young branches. After being freed from the oily constituents by pressing, the crude camphor showed the optical rotation of  $+42^{\circ} 20'$ . It very closely resembles the Chinese camphor prepared from the leaves.—Schimmel's Semi-Ann. Rep., October, 1913, 34; from Bull. Imp. Inst., 11 (1913), 46.

**Oil from "Wild" Cardamoms.**—*Yield and Properties.*—"Wild" cardamoms, originally derived from Indo-China, of which the parent plant was identified as *Anomum globosum*, Lour., when distilled by Schimmel & Co. yielded 4% of a colorless oil showing the following constants: Sp. gr., 0.9455; opt. rot.,  $+43^{\circ} 54'$ ; refr. index, 1.47141; acid val., 0.8; ester val., 128.4; insoluble in 10 vols. of 70% alcohol; soluble in 1 vol. of 80% alcohol. These constants show some similarity with the oil from "Ceylon cardamom seeds," but the oil differs materially from the latter in odor, which reminds rather of camphor, and is therefore useless as a cardamom oil



proper. The pronounced odor of camphor points to a considerable proportion of this as a constituent, but no definite determination could be made with the small sample available. Schimmel's Semi-Ann. Rep., April, 1913, 111.

**Oil of Celery**—(*Characteristic Sesquiterpene*).—Semmler and Risse have shown that the sesquiterpene of celery oil, to which the name *Selinene* has been applied, forms a dihydrochloride, which on elimination of the hydrochloric acid in the usual manner yields a sesquiterpene which is not quite identical with the original selinene. They assign the name  $\psi, \beta$ -selinene to original selinene, and ortho- $\alpha$ -selinene to the regenerated sesquiterpene. The characters of the two bodies are as follows:

	Original.	Regenerated.
Sp. gr. at 20°.....	0.9190	0.9190
Refractive index.....	1.5092	1.5092
Specific rotation.....	+61° 30'	slightly higher
Boiling point at 11 Mm.....	128–132°	128–132°

The natural hydrocarbon yields a large amount of a diketone on oxidation with ozone, whereas the regenerated sesquiterpene yields principally a complex acid. It is probable that during the elimination of the hydrochloric acid a double linkage in a side chain is displaced into one of the rings—the sesquiterpene being a bicyclic compound.—Chem. and Drugg., May 17, 1913, 752; from Berichte, 45, 3725.

**Volatile Oil of Cherry Kernels.**—*Yield, Characters and Constants.*—Schimmel & Co. have prepared and describe the volatile oil of cherry stones, a hitherto unknown product. The stones were ground up with the shell, mashed up, and the paste, after standing several hours, distilled with steam. So obtained, in a yield of 0.016 per cent., the oil was colorless to pale yellow, had an odor similar to but clearly distinct from bitter almond oil, and showed the following constants: Sp. gr., 1.0532; opt. rot., +0°; refr. index, 1.53888; soluble in 2.5 and more of 60% alcohol. It contained 0.27 per cent. of hydrocyanic acid. Schimmel's Semi-Ann. Rep., April, 1913, 111.

**Seychelles Cinnamon Bark Oil.**—*Constitution Similar to That of Ceylon Cinnamon Oil.*—In their Report of November, 1908, Schimmel & Co. made some statements regarding the constituents of Seychelles cinnamon bark oil, which pointed out the presence of a number of bodies that were characteristic of the oil from Ceylon cinnamon bark. They now report the results of further investi-

gations, which make it evident that the Seychelles oil contains the same constituents as Ceylon cinnamon oil, and that if corresponding larger quantities of raw material were worked up, it is probable that the constituents of Ceylon oil which have so far not been found present in the Seychelles oil would be shown also to occur therein.—Schimmel's Semi-Ann. Rep., April, 1913, 42-43.

**Ceylon Citronella Oil.**—*Adulteration with "Automobile-Benzine."*—From the analysis of a sample of citronella oil recently submitted to Schimmel & Co. for examination, they believe to be justified in concluding that certain kinds of "motor-spirit" (automobile-benzine) have lately been used as adulterants of Ceylon citronella oil. The sample in question showed the following constants: Sp. gr., 0.8873; opt. rot.,  $-11^{\circ} 12'$ ; so-called total geraniol, 55.6%; sol. in its own vol. of 80% alcohol, but the solution becoming almost turbid on the addition of 5 vols. of the solvent. While the percentage of so-called geraniol must be described as tolerably sufficient, the oil was suspicious on account of its abnormally low specific gravity. Further examination clearly showed this abnormality due to sophistication, for on fractionation 10% of a fraction boiling between  $80^{\circ}$  and  $160^{\circ}$  was obtained, whereas in a check test with normal oil practically nothing at all passed over below  $160^{\circ}$ .—Schimmel's Semi-Ann. Rep., April, 1913, 46.

**Java Citronella Oil.**—*Adulteration with Benzin.*—Since reporting on the adulteration of Ceylon citronella oil with benzin (see preceding abstract), Schimmel & Co. have found two samples of Java citronella oil to be similarly adulterated. In one case the addition was so considerable as to strongly affect, not only the sp. gr., but also the solubility and the total geraniol content: Sp. gr., 0.8667; opt. rot.,  $-1^{\circ} 52'$ ; refr. index, 1.46161; so-called total geraniol, 71.5%; did not give a clear solution with 80% alcohol. As in the case of the Ceylon oil referred to, the behavior under fractionation was abnormal. In the case of the second sample of Java oil, the sophistication, being of less extent, was traceable only by the low specific gravity, the other constant giving no cause for suspicion, although the total geraniol content was comparatively low. As was pointed out by Dodge some time ago, the stability of benzin towards permanganate affords a useful clue to the detection of these adulterants in citronella oil.—Schimmel's Semi-Ann. Rep., October, 1913, 43-44.

**Oil of Roasted Coffee.**—*Pyridine a Constituent.*—G. Bertrand and G. Weisweiler have identified pyridine as an essential constitu-

ent of the volatile oil of parched coffee, which, when the pyridine has been removed from it, no longer possesses the true aroma of coffee. From 5 Kgm. of ground, freshly roasted beans, from 1 to 2 Cc. of a volatile oil was obtained by distillation with water, possessing the aroma of coffee but having at the same time an odor of amyl alcohol, furfural and pyridine. To identify the latter, the base was extracted from the oil by treatment with hydrochloric acid. The aqueous solution of the base afforded characteristic pyridine silicotungstate when barium silicotungstate was added, and the isolated base, when boiled with aqueous platinum chloride, yielded the platino pyridine salt  $(C_5H_5N)_2PtCl_4$ , which is almost insoluble in water. Both the tungstate and the platino salt were identified by analysis.—Schimmel's Semi-Ann. Rep., October, 1913, 47; from Compt. rend., 157 (1913), 212.

**Oil of Costus Root.**—*Yield.*—According to Puran Singh's experiments, costus root from Kashmir, derived from *Saussurea lappa*, yielded 2.78% of volatile oil, whereas the statements in the literature on the subject give only 0.8 to 1% as the yield of the oil.—Schimmel's Semi-Ann. Rep., October, 1913, 47; from Board of Scientific Advice for India.

**Oil of Croton Gratiissimus.**—*A New Volatile Oil.*—Through the intermediary of Mr. A. Zöller, Schimmel & Co. received a small sample of leaves and fruits indigenous to German Southwest Africa, which, they were subsequently informed, were derived from *Croton gratissimus*, Burch, and which is used by the natives for preparing ointments. By distillation, 0.7% of a greenish oil, having an odor reminding of calamus, was obtained, but the quantity of material was too small to permit a nearer examination.—Schimmel's Semi-Ann. Rep., October, 1913, 111.

**Oil of Cydnus Indicus.**—*A Malodorous Insect Oil.*—According to E. R. Watson an evil-smelling Indian bug, *Cydnus indicus*, exudes a fatty oil which contains about 1.5% of constituents volatile with steam. These constituents are composed of an acid,  $C_8H_{14}O_2$ , probably "cycloheptane carboxylic acid," and a small quantity of a non-acid compound which may possess the empirical formula  $C_{11}H_{20}O_2$ . The acid has a strong rancid odor; that of the non-acid substance is more powerful still.—Schimmel's Semi-Ann. Rep., April, 1913, 50; from Proc. Chem. Soc., 29 (1913), 28.

**Oil of Cydnus Indicus** (*Stibaropus Molginus.*)—*Additional Details Regarding Characters and Sources.*—In a supplementary



paper Mr. Watson gives particulars of his work and mentions in a foot-note that in the Indian Museum the insect has been identified as *Stibaropus molginus*, Schiödte, not as *Cydnus indicus*. Consequently this malodorous volatile oil is properly called

**Oil of Stibaropus Molginus.**—In the course of his experiments the author used altogether 1 lb. of material, representing 100,000 insects, obtaining 1.5% of a volatile oil containing about 90% of cycloheptane carboxylic acid. The remaining 10% of the oil, having perhaps the empirical formula  $C_{11}H_{20}O_2$ , apparently constitutes the carrier of the odorous principle of the insect. This compound possesses an extremely intense odor, a single insect containing only about 0.000005 grain of this substance; but this is sufficient to "scent" a whole room.—Schimmel's Semi-Ann. Rep., October, 1913, 48; from Journ. Chem. Soc., 103 (1913), 548.

**Cypress Oil.**—*Constituents.*—In 1904 Schimmel & Co., calling attention to the value of cypress oil as a whooping cough remedy—a reputation which has since become well established—published the results of their examination of this oil (see Proceedings, 1904, 863) in which they referred incidentally to two alcohols, one of which at the time they thought themselves warranted in describing as sabinol. They have recently again taken up this research, with the result that they discovered the principal constituent of the alcohol mixture (distilled between 70° and 80°, 3 to 4 Mm.) to be an alcohol  $C_{10}H_{18}O$  = terpinenol-4, a body previously detected by them in European wormseed oil, in juniper berry oil and in nutmeg oil. The second alcohol, of which they made mention at the same time, has also been investigated, but unfortunately a part of this was decomposed during the manipulation and its identification is therefore not complete. The pure alcohol,  $C_{10}H_{18}O$ , has a pleasant, rose-like odor. It composes the smaller part of the above-mentioned alcohol mixture and had the following constants: B. p., 76° to 77°, 4 to 5 Mm. (210° 212°, ord. press.); sp. gr., 0.9422; opt. rot., +43° 38'; refr. index, 1.46678.

With regard to the cypress oil fractions with the highest b. p., which possess in a more pronounced degree the peculiar balsamic odor, the most recent observations showed that they contain, besides cadinene and cypress camphor, a second liquid sesquiterpene alcohol, with the formula  $C_{15}H_{26}O$ . This alcohol boils between 136° and 138° (4 to 5 Mm.), that is to say, at a considerably higher degree than does cypress camphor, which is the principal



body found in the fractions with b. p.  $123^{\circ}$ – $125^{\circ}$  (4 Mm.).—Schimmel's Semi-Ann. Rep., April, 1913, 50–52.

**Emmenagogue Oils.**—*Action.*—A report by Macht on the action of apiol and the oils of pennyroyal, savine, tansy, rue, thyme and turpentine, indicates that these substances have no specific or directly stimulating action whatever on the uterine muscle, that on the contrary they inhibit the contractions of the uterus and even paralyze it. It ought to be clear then, once for all, that if these oils exhibit any "emmenagogue" or abortifacient phenomena whatever in the organism it is due to a general constitutional poisoning or gastro-intestinal irritation and not to any specific action in accord with the intent with which they are sometimes administered.—J. Am. M. Assoc., 1913, v. 61, 1725. (M. I. W.)

**Oil of Eucalyptus, B. P.**—*Practice of Standardization with "Amygdalina" Oil.*—Ernest J. Parry observes that there has been for some time past a good deal of eucalyptus oil on the market which has characters approximating to the following:

Sp. gr.....	0.909 to 0.911
Optical rotation.....	$-9^{\circ}$ to $-11^{\circ}$
Eucalyptol.....	48 to 58 per cent.
Phellandrene.....	crystals formed, but not enough to solidify the mass.

The odor is characteristic of oil of *Eucalyptus amygdalina*. In those cases where the figures fall outside the Pharmacopœia limits no difficulty arises, as the oils are, of course, condemned on the figures. But where the figures fall just within the official limits a different question arises. It has been contended that such oils, which have been standardized down to the official limit figures with amygdalina oil, are in fact "B. P." He thinks this contention is totally unfounded, and that the practice of diluting B. P. oils with amygdalina oils should be stopped, on the ground that the resulting oil is not B. P.

The wording of the Pharmacopœia is "the oil distilled from the fresh leaves of *Eucalyptus globulus* and other species of *Eucalyptus*." Then follow the characters and tests. It should be noted that the wording is not "and all other species," nor "and any other species." It is quite clear then that no oil is in accordance with the requirements of the British Pharmacopœia unless it is distilled from a species of eucalyptus that will yield an oil having the characters and tests mentioned. Now it is a fact, universally admitted, that the oil of *E. amygdalina* will not answer these requirements; indeed, the

phellandrene test was introduced with the specific intention of excluding amygdalina oil, so that the oil of *E. amygdalina* is most emphatically "not B. P."—Chem. and Drugg., March 8, 1913, 358.

**Eucalyptus Oils.**—*Classification.*—In connection with the preceding strictures of Mr. Parry, the following statement of an Australian distiller of eucalyptus oil, quoted by the "Chemist and Druggist," is interesting. He says:

"All the eucalyptus oil distilled in Victoria can be divided, from a chemical standpoint, into four classes:

	S. G.	Eucalyptol.	O. R.	Phellandrene.	Solubility in 70% Alcohol.
(1) Mallee oils.....	0.924	76%	0°	absent	1 $\frac{1}{4}$ vol.
(2) Globulus oils.....	0.918	60%	0°	absent	1 $\frac{1}{2}$ vol.
(3) Gippsland oils.....	0.900	30%	—20°	trace	1 $\frac{3}{4}$ vol.
(4) Amygdalina.....	0.870	..	—60°	present	insol.

"A blend of Mallee 1 part and Gippsland 1 part gives sp. gr. 0.912, eucalyptol 53 per cent., opt. rot. —10°, and phellandrene a trace; while a blend of Mallee 2 parts and Amygdalina 1 part gives sp. gr. 0.906, eucalyptol 51 per cent., opt. rot. —20°, and phellandrene present. It is therefore impossible to blend these two classes to make a B. P. oil, because when the eucalyptol is right the sp. gr. and opt. rot. are wrong."—Chem. and Drugg., April 5, 1913, 504.

**Oil of Eucalyptus.**—*Industrial Production at Bendigo, Victoria.*—The "Bendigo Advertiser" of March, 1913, contains interesting information on the eucalyptus oil industry at Bendigo in the State of Victoria, Australia. In that district an area of about 40 square miles is known as the "Whipstick Scrub"—a desolate country with low eucalypts—the two species of *Eucalyptus* there growing being known by the collectors as "snake juice" and "blue mallee," and, until recently, thought to be, respectively, *Eucalyptus viridis* and *E. dumosa*. It has now been shown, however, that the "blue mallee" of the "Whipstick Scrub" is not *Eucalyptus dumosa* but *E. polybractea*. The oil from the latter species was shown by Baker and Smith, in 1902, to have the following properties: Sp. gr., 0.9143; opt. rot., —2.13°; acid val., 1; ester val., 3.5; soluble in 1 $\frac{1}{2}$  vols. of 70% alcohol; while the oil from *E. dumosa* showed the following constants: Sp. gr., 0.9151; opt. rot., +6.34°; acid val., 0.6; ester val., 2.3; soluble in 1 $\frac{3}{4}$  vols. of 70% alcohol.—Schimmel's Semi-Ann, Rep., October, 1913, 55.

**True Oil of Eucalyptus Globulus.**—*The California Product and the U. S. P. Solubility Test.*—In a paper presented in the Section on Practical Pharmacy and Dispensing at the 60th annual meeting of the Association, Edward G. Binz says that *Eucalyptus globulus* is the only variety of the eucalypts growing in the State of California in sufficient quantities to distill oil from, and that consequently all eucalyptus oil distilled in that state must be true oil of the "globulus" species. He has made a particular effort to get oils of eucalyptus that have been distilled from leaves growing in various parts of the State, and has carefully applied the 70% alcohol solubility test, but has found none that will form a clear solution with three volumes of 70% U. S. P. alcohol, either in the crude state or after it has been refined. On the other hand, the oil of California *Eucalyptus globulus*, when carefully distilled, will stand every test of the Pharmacopœia with this one exception, unless a process of rectification (by fractionation) be adopted which inevitably results in a sacrifice of 60% of the original product—a procedure which is out of question; the more particularly, since the California "globulus" oil will at all times show a eucalyptol content as high as 60% and 70%, which is above the U. S. P. requirement. If, therefore, we are to conform to the 70% solubility test, then California will have to leave the market to the foreign oil.—Journ. A. Ph. A., February, 1913, 183-184.

**Eudesmol and Globulol.**—*Two Characteristic Constituents of Eucalyptus Oils.*—Eudesmol, a body discovered by Smith in 1899, is a constituent of numerous eucalyptus oils, but so far hardly anything is known of its constitution. In the course of a recent thorough investigation of this remarkable compound, which had been surmised by Semmler to be a bicyclic sesquiterpene alcohol, the latter, in collaboration with E. Tobias, has now clearly shown that eudesmol is in fact a bicyclic unsaturated sesquiterpene alcohol, to which the authors attribute the following constants: M. p., 78°; b. p., 156° (10 Mm.); sp. gr. 20°, 0.9884; opt. rot., +31° 21' (12% sol. in chloroform); refr. ind., 1.516; mol. refr. (calculated for  $C_{15}H_{26}O = 68.069$ ) found, 67.85. With regard to its characters it ranks with cadinene, selinene, isozingiberene, etc., hence belongs to that group of the sesquiterpenes which is derived from hydrogenated naphthalin. On treatment with hydrogen chloride-glacial acetic acid it yields *eudesmene* dihydrochloride, m. p. 79° to 80°. Eudesmene dihydrobromide melts between 104° and 105°.

In conclusion, Semmler and Tobias refer to the sesquiterpene

alcohol which was discovered by Schimmel & Co. (1904) in oil of *Eucalyptus globulus*. For this they propose the name of *globulol*, which certainly differs physically, and probably also chemically, from eudesmol—the relation of the two being possibly similar to that existing between borneol and *isoborneol*.—Schimmel's Semi-Ann. Rep., October, 1913, 58-59; from Berl. Berichte, 46 (1913), 2026.

**Fennel Herb Oil.**—*Characters and Constants.*—An oil distilled from fennel herb on the island of Jersey (subsequently identified as derived from *Feniculum vulgare*, Miller), was submitted to Schimmel & Co. for their opinion, who describe it as a colorless liquid with an odor of estragon. It was soluble in 5 vols. and more of 80% alcohol, with slight turbidity; sp. gr., 0.9561; opt. rot.,  $+16^{\circ}40'$ . The oil contains only a very small proportion of anethol, but, judging from its odor, methyl chavicol is an important constituent.—Schimmel's Semi-Ann. Rep., April, 1913, 111.

**Geranium Oils.**—*Proportion and Composition of Alcohols.*—In a paper presented to the British Pharmaceutical Conference, 1913, W. H. Simmons describes the results of experiments undertaken with the purpose of ascertaining the value of the so-called "formylation process" for differentiating between geraniol and citronellol in geranium oils. This process, as recommended by Jeancard and Satie, consists in heating 10 Cc. of oil with 20 Cc. of 98 to 100 per cent. formic acid in a flask attached to a reflux condenser for one hour on either a water bath or a sand bath. Either method of heating appears to have little effect on the result, but considerable bumping occurs when the mixture of oil and formic acid is boiled on a sand bath. The addition of 2 grams of anhydrous sodium formate per 10 Cc. of oil enables the mixture to be boiled steadily on a sand bath, without affecting the result. A determination of "total alcohols" by acetylation, and of "citronellol" by formation of (1) Schimmel's geraniol, (2) Schimmel's "citronellol," and (3) a mixture of (1) and (2) in equal proportions, gave the following results:

	Total Alcohols as Geraniol, Per cent.	Citronellol, Per cent.
1. Geraniol.....	99.6	13.7
2. Citronellol.....	100.4 <sup>1</sup>	83.4
3. Mixture of 1 and 2 in equal proportions.....	...	47.3

<sup>1</sup> Calculated as citronellol, 101.6 per cent.



Formylation of a sample of palmarosa oil also gave an apparent citronellol content of 14 per cent. From these results it is evident that, assuming the above samples to represent 100 per cent. geraniol and 100 per cent. citronellol, formylation does not completely convert geraniol into terpene, nor does it completely esterify citronellol. To ascertain the value of the process as a comparative test, a number of African and Bourbon geranium oils have been examined by the two processes, with the following results:

		Percentage Composition of Alcohols.		
	Total Alcohols,	Citronellol,		
	Per cent.	Per cent.	Geraniol.	Citronellol.
African	72.8	40.0	45	55
	70.0	42.8	39	61
	79.5	33.4	58	42
	69.3	32.0	54	46
	69.6	34.8	50	50
	76.8	33.6	56	44
Bourbon	73.0	50.2	31	69
	71.7	44.0	39	61
	70.4	46.8	34	66
	69.7	51.0	27	73

The author also gives corresponding figures obtained for two less common varieties of geranium oil, *viz.*, (1) Corsican, 69.8 per cent. of alcohols as geraniol; and (2) Trappe de Staoüeli, 71.5 per cent. In these cases the alcohols were composed of geraniol (1) 57 and (2) 61, and citronnellol (1) 43 and (2) 39. An Asian oil contained 63.9 per cent. of citronellol.

From the results the process appears to be of considerable utility in judging of the quality of a geranium oil, and it is proposed shortly to investigate the subject further. *Trans. Brit. Pharm. Conf.* (Yearbook of Pharmacy), 1913, 565-568.

**Geraniol and Citronellal.**—*Experiments to Establish an Accurate Standard for Java Citronella Oil.* J. Allan and C. W. Moore record experiments undertaken with geraniol and citronellal with a view to testing the accuracy of the standard test for Java citronella oil. The authors observe that there seems to be little doubt that citronellal undergoes some decomposition during the acetylation process, which tends to give abnormally high results when the acetylated oil is saponified. Concordant results were obtained without difficulty in the case of geraniol, and the tables provided show this conclusively. With citronellal it seems probable that the trouble lies in the process of washing the acetylation

product, and further experiments will be made.—Pharm. Journ. and Pharmacist, Jan. 25, 1913, 96; from *Perfum. & Essent. Oil Record*, Jan., 1913.

**Ketones.**—*Estimation.*—In the course of a review of the various methods proposed for the determination of ketones in volatile oils, Labbé points out that this determination is by no means so easy or accurate as is generally the case with aldehydes, and that no general method can be said to exist. He states that the most general method is that of Benedikt and Shache, which consists in the estimation of the carbonyl oxygen, which is then calculated to the ketone under consideration. The method is carried out as follows:

A known weight of the oil is heated with a known weight of phenylhydrazine. The hydrazine formed is, after cooling and being allowed to stand, separated by filtration, and the phenylhydrazine remaining in the filtrate is oxidized by boiling with Fehling solution. In this reaction the nitrogen is given off in the gaseous condition, and can be collected and measured, and thus the amount of phenylhydrazine entering into combination calculated, and so the amount of ketone deduced.

The author points out that this method gives accurate results with, for example, oil of rue (methyl-nonyl-ketone), but not with several other ketones. His own method, which is particularly applicable to ketones of the carvone type, is as follows: Five Cc. of the oil (such as caraway, peppermint, etc.) are placed in a flask having a 100 Cc. bulb prolonged into a graduated cylinder. The bulb is then filled to about two-thirds of its volume with a saturated solution of sodium bicarbonate and neutral sodium sulphite. The mixture is well shaken for thirty seconds, and then the apparatus is almost entirely filled with the sulphite solution. It is then well shaken for five minutes and then inverted, so that the unabsorbed oil rises to the surface. The results, by this process, he says, are correct to within 0.5%.—*Chem. and Drugg.*, May 17, 1913, 741; from *Journ. de Parfum.*, 4 (1913), 37.

**Oil of Lantana Camara.**—*Properties and Constants.*—Schimmel & Co. describe an oil distilled from the flowers of *Lantana camara*, L., a sample of which they received from the Indian Institute of Science at Bangalore. This oil, about which there are but few references in the literature, was a yellow liquid without any characteristic odor, the other characters being as follows: Sp.

gr., 0.9274; opt. rot.,  $+14^{\circ} 50'$ ; acid val., 0.9; ester val., 24.3. Owing to its high paraffin content its solution, even with 95% alcohol, was only clear at the beginning; when more than 0.5 vol. of the solvent was added there was a pronounced separation of paraffin. The small sample available precluded a closer investigation, including especially acetylation. The latter, however, has been carried out at the Institute itself, and the analytical values communicated were: Sp. gr.  $^{26^{\circ}}_{15^{\circ}}$ , 0.915; refr. index, 1.4987; sap. val., 10; ester val. after acetylation, 43.65.—Schimmel's Semi-Ann. Rep., October, 1913, 66.

**French Oil of Lavender.**—*Caryophyllene, a Constituent.*—Schimmel & Co. have recently isolated from French lavender oil of their own distillation a fraction having the following constants: Boiling point,  $89^{\circ}$  to  $90^{\circ}$  (3 Mm.); sp. gr., 0.9008; opt. rot.,  $+0^{\circ} 49'$ ; refr. index, 1.49856. These constants pointing to caryophyllene, the oil was hydrated by heating it with glacial acetic acid and sulphuric acid and from this was obtained caryophyllene alcohol, having the melting point  $93^{\circ}$  to  $94.5^{\circ}$ , the phenylurethane prepared from this, having the m. p.  $136^{\circ}$  to  $137^{\circ}$  (from methyl alcohol). The investigation demonstrates the presence of caryophyllene in lavender oil.—Schimmel's Semi-Ann. Rep., April, 1913, 70.

**Oil of Lemon.**—*Methods for the Estimation of Citral.*—Schimmel & Co. mention that the so-called hydroxylamine method for the estimation of citral in oil of lemon, which was proposed by J. Walther about 15 years ago, and somewhat modified in 1909 by A. H. Bennett, has recently been again experimented with in its modified form by several English chemists, who obtained results which agreed in the most satisfactory manner; the citral content of one and the same sample of oil, as tested by five different chemists, having been found from 3.8 to 4%. Schimmel & Co. are quite willing to admit that the values given by this modified method will agree if all the investigators work under exactly similar conditions; but they maintain that this does not alter the fact that in actual practice the results obtained are slightly too low, as pointed out by them in a criticism in their Report of October, 1909. The experience has recently been again confirmed; for example, in the case of a citral which, when treated with neutral sodium sulphite, was found to test 99%, while only 91.1% aldehyde was obtained with hydroxylamine, a result which agreed with their previous observations that the values were about

10% too low. Much better values are obtained by Kleber's phenylhydrazine method (see Year Book, 1912, 336). By applying this method, the same citral gave 97.1 and 97.7% aldehyde, values which closely approximate to those when neutral sodium sulphite is used. A similar state of things obtains in the case of oil of lemon, except that here, owing to the low citral content *per se*, the difference is not so marked, and therefore the hydroxylamine method may generally be sufficient for practical purposes. But even here the phenylhydrazine method should be preferred, because the results agree more closely with the actual facts, and are therefore more accurate.—Schimmel's Semi-Ann. Rep., October, 1913, 53.

**Oil of Lemon.**—*Modern Increase in Adulteration.*—Schimmel & Co. observe (in their April Report, 1913) that while it was to be expected, owing to the present high price of lemon oil, that a good deal of adulterated oil would be placed upon the market, their examination of numerous samples of sophisticated oil of lemon in their laboratory during the last few months has driven them to the conclusion that the practice of adulteration has assumed previously unheard-of dimensions. In most instances turpentine oil was the adulterant, but spirit, mineral oil, lemon oil terpenes, and carvene or orange oil terpenes were also encountered. They have brought together the characters of the samples examined, exhibited in a table, mentioning also the adulterant in the case of each particular oil, and give the following:

**Limits of Value of Good Commercial Lemon Oil** at present on the market: Sp. gr., 0.856 to 0.861; opt. rot., mostly +57 or +61; opt. rot. of the initial 10% of oil, up to 6% less than the optical rotation of the original oil; citral content, about 4 to 5%; evaporation residue, 2.1 to 4%; sap. val. of evaporates, generally 150 to 220.—Schimmel's Semi-Ann. Rep., April, 1913, 60 to 61.

**Oil of *Lophanthus Anisatus*.**—*Characters of an Authentic Distillate.*—Up to the present very little is known concerning the oil of *Lophanthus anisatus*, Benth. Schimmel & Co. have now distilled this oil by steam in a yield of 0.11%, from a parcel of lophanthus herb, received through the kind offices of Prof. E. Heckel, from the Botanical Garden in Marseilles. The oil was brownish green, had a pleasant anise-like odor, and otherwise the following characters: Sp. gr., 0.9640; refr. index, 1.51655; acid val., 2.8; ester val., 14.0; soluble in 0.5 to 1 vol. and more of 90% alcohol. By distillation under diminished pressure



(3 Mm.), about 80% passed over uniformly at 68°. This fraction consists exclusively of methyl chavicol, which body therefore forms the bulk of lophanthus oil.—Schimmel's Semi-Ann. Rep., October, 1913, 73.

**Philippine Mandarin Oil.**—*Botanical Source and Conditions of the Fruit Yielding It.*—In their Report of 1912, Schimmel & Co. referred to an oil which had been prepared from the fruit of *Citrus reticulata*, Blanco, known in the Philippines as "Naranjita" (see Year Book, 1912, 341). According to H. D. Gibbs and F. Ageaoli, *Citrus reticulata*, Blanco is a synonym for *Citrus nobilis*, Lour., and they observe that, generally speaking, the Philippine plantations of this species of *Citrus*, which resembles the mandarin, present an extremely neglected appearance. Many of the trees are infected by insects or are overgrown with parasites. In most places the trees have been planted too thickly, and the ground is covered by shrubs and weeds.—Schimmel's Semi-Ann. Rep., October, 1913, 53; from Philippine Journ. of Sci., 7 (1912), A. 403.

**Oil from *Mentha Citrata*.**—*Properties.*—R. C. Roark reports the results of a physical and chemical examination of a volatile oil distilled by him from plants of *Mentha citrata*, Ehrh., during the summer of 1910, the plants being raised in the garden for the cultivation of medicinal plants at Madison, from roots sent from Washington by Dr. R. H. True.

The oil had a clear yellow color, an intense but rather pleasant odor, and had the following properties, *viz.*, sp. gr. at 22° = 0.895; refr. index at 19.5°, 1.4555; opt. rot. in a 200 Mm. tube, —176°. The chemical examination showed the presence of 3.50% of aldehydes. On saponifying the oil deprived of aldehydes, saponification numbers of 230 and 234.7 were obtained, indicating the presence of 80.50 and 82.15% of an ester assumed to be *linalyl acetate*; but this was subsequently reduced by acetylation of the oil to 63.70 and 64.75%. Although the presence of *linalyl acetate* has only been assumed and not at all proven, this discrepancy between the original ester content and the lower content of the acetylated oil is in harmony with the assumption of the presence of *linalool*, which is partly decomposed by the acetic anhydride during the acetylation process.—Journ. A. Ph. A., July, 1913, 839-841.

**Oil of *Ocotea Bark*.**—*Yield, Properties and Composition.*—A sample of the bark of *Ocotea pretiosa*, Benth. (*Cryptocaria pretiosa*

Mart.: *Mespilodaphne pretiosa*, Nees et Mart.), which had been received from Brazil, where it is used as a remedy in gout, has been distilled by Schimmel & Co., yielding 0.83 per cent. of a brown oil of cinnamon-like odor. Its sp. gr. was 1.200 and its refractive index 1.52712, but owing to its dark color the rotatory power could not be determined. Notwithstanding its cinnamon-like odor, no cinnamon aldehyde could be detected. It is probable that its constituents do not include esters, but lactone compounds. The oil was found to be strongly nitrogenous. It probably contains caryophyllene.—Schimmel's Semi-Ann. Rep., April, 1913, 76.

**Origanum Oils.**—*Confusion Regarding the Term "Marjoram Oil."*—How the naming of oils from the vernacular names of the parent plants from which they are derived can lead to confusion is shown by E. M. Holmes in the case of marjoram oil. In France *Origanum vulgare* and *O. majorana* are distinguished by the names of *marjolaine sauvage* and *marjolaine douce*. In Southern France *Calamintha nepeta* is also frequently called *marjolaine* instead of *Calaminthe népète*, a fact which leads to oil of *Calamintha nepeta* being frequently brought into commerce under the name of marjoram oil. Mr. Holmes (in "Perfum. and Essent. Oil Record," 3, 1912, 322) gives a detailed botanical description of *Origanum majorana*, L., and *Calamintha nepeta* (lesser calamint) together with clear illustrations of the entire plant and the inflorescence.—Schimmel's Semi-Ann. Rep., April, 1913, 76.

**Oil of Peppermint and Menthol.**—*Distinction of Their Alcoholic Solutions.*—M. Durieu suggests the following simple test for the distinction of alcoholic solution of oil of peppermint and of menthol. If diluted solution of iodine is slowly dropped into an alcoholic solution of oil of peppermint, the color produced by the iodine is quickly discharged on shaking the mixture, whereas in an alcoholic solution of menthol no such decoloration results.—Pharm. Ztg., lviii (1913), No. 22, 217; from L'Union Pharm., 1913, p. 33.

**Japanese Peppermint Oil.**—*Industrial Production, Yield, Etc.*—The following interesting particulars concerning the Japanese peppermint oil industry are abstracted from a report of the British commercial attaché at Yokohama: Peppermint is cultivated in different parts of Japan, mostly on the hillsides, although that grown on low-lying ground which can alternately be used for rice is richest in "crystals." The best oil is produced in the districts of Okayama and Hiroshima, where three cuts are made

yearly—in May, June, and August. The first cut yields about 47% of crystallized menthol, the second about 53%, and the third about 60%. In the district of Yamagata only two, and in Hokkaido only one cut is made, but in the last-named district the area under cultivation is considerably larger than in the others, so that in spite of only a single crop and a menthol yield of only 45%, more than half of the total output of menthol is produced in the province of Hokkaido. The method of distilling is the same everywhere. It lasts four hours, the yield from 82 lbs. of dry leaves of the first cut being 14, of the second 24, and of the third 21 ozs. of oil, or 1.07, 1.83 and 1.60%, respectively. The second cut is always the most prolific; thus, for example, a field which produces 300 lbs. of leaves in the first cut will yield 800 lbs. in the second and 600 lbs. in the third. The production per acre is about 5000 lbs. of dry leaves, yielding about 80 lbs. (= 1.60%) of oil—this yield, of course, depending on the quality and the dryness of the leaves. The oil is collected by brokers, and resold to the large refineries, of which there are two of importance. In the districts of Odashitsuki, Okujoto, and Bingo, there are so-called “peppermint-guilds,” who test the oil and give certificates of purity.—Schimmel's Semi-Ann. Rep., April, 1913, 81; from Board of Trade Journ., 79, 78.

**Japanese Peppermint Oil.**—Complementary to the preceding article, the following particulars, taken from a publication by Yeinosuke Shinosaki on the peppermint industry of Japan, are interesting: Two varieties of Japanese peppermint (*Mentha arvensis*) are known, and distinguished as “Aomaru-” and “Akamaru-” mint. The first-named is of rapid growth but yields an inferior oil, for which reason only the second variety is grown for oil. In Katami, however, experiments are carried on in the cultivation of English and German peppermint. The stem of the Akamaru-mint is of a violet-red color, but this disappears as the plant grows older. The petals of the flowers are of a pale violet. In Hokkaido the peppermint plant sprouts in spring and flowers in the autumn. It is generally cultivated in a dry, warm, alluvial soil. The oil yield reaches its maximum 2 or 3 years after planting, and then gradually diminishes, so that the fields have to be replanted after 4 or 5 years. The crop is gathered on a sunny day in September before the frost sets in. The cut herb, collected in bundles, is tied together with straw into small sheaves and hung up for drying on the roofs of houses. Drying takes from 3 to 4 weeks. The yield is from 2200 to 3300 lbs. of dry herb



per acre. Distillation, for which the several kinds of stills in use are described by the author, commences in the middle of October and continues until the end of November. The author gives some particulars of the growth of the different varieties of peppermint, and has also studied the effect of the method of drying the herb upon the condition of the oils, but only slight differences were observed. The following table gives the characters of the oils distilled at Katami from Japanese, German and English peppermint herb grown locally:

Oil from	Japanese Herb.	German Herb.		English Herb.		German Herb from
		1910.	1911.	1910.	1911.	Okayama.
Sp. gr. 15°.....	0.8989	0.9638(?)	0.9105	0.9228	0.9132	0.9161
Opt. rotation.....	-28.92°	.....	-42.25°	-52.25°	-63.60°	-18.15°
Index of refraction,						
20°.....	1.4602	1.6117	1.4672	1.4717	1.6573	.....
Acid value.....	0	19.53	0	4.42	7.06	3.45
Menthyl acetate...	6.35%	24.94%	11.08%	26.50%	13.65%	8.36%
Total menthol.....	69.30%	85.71%	66.30%	66.88%	75.60%	58.61%
Solubility in 70% alcohol at 20° in						
vols.....	2.8 vols.	2.5 vols.	insol. in 15 vols.	insol. in 15.3 vols.	insol. in 15.3 vols.	insoluble

—Schimmel's Semi-Ann. Rep., October, 1913, 85-87; from Journal Ind. and Eng. Chem., 5 (1913), 656-658.

**Oil of Prostanthera Cineolifera.**—*Properties and Constituents.*—R. F. Baker and H. G. Smith have distilled from the green herb of *Prostanthera cineolifera*, one of about 50 species of *Prostanthera*, all indigenous to Australia, a yellowish oil in a yield of 0.71%. The oil turned brown after being exposed to the air a short time, had the sp. gr. 0.9204, a refr. index of 1.4711, and when freed from phenols and aldehydes showed an optical rotation of +4.1°, and a sap. val. after acetylation of 34.2. Among the phenols, both carvacrol and thymol were present, and it contained both cuminic aldehyde and *p*-cymene, but the principal constituent was cineol, which was present to the amount of about 61%.

Schimmel & Co., to whom a sample of this oil was sent by the authors, describe it as being a pale brown liquid, with an odor resembling that of cajaput or eucalyptus oil: Sp. gr., 0.9477; opt. rot., +3° 58'; refr. index, 1.47319; sap. val., 2.7; ester val. 17.4; soluble in its own vol. and more of 80% alcohol. The cineol content was about 35% (resorcinol method), the phenol content



about 2%. Schimmel's Semi-Ann. Rep., October, 1913, 89; from Journ. and Proc. Royal Soc. of N. S. W., 46 (1912), 103.

**Oil of Ravensara Aromatica.**—*Properties.*—Feraud and Bonnafous describe a volatile oil distilled from the leaves of the laurel *Ravensara aromatica*, J. F. Gmel., a stately tree occurring on the high plateaus of Madagascar. The bulk of this oil boils between 170° and 175°, only a small amount passing over up to 170°. By repeated distillation the authors obtained from the oil a fraction boiling between 172° and 173° which, after being allowed to stand over sodium, afforded a fraction having the following constants: B. p., 171° to 172°; sp. gr., 0.8809; refr. index, 1.4616. Combustion showed the oil to possess oxygenous constituents; but the authors believe the oil to consist principally of a terpene, contaminated by an oxygenous compound which is difficult to remove. Schimmel's Semi-Ann. Rep., October, 1913, 89; from Bull. de Science Pharmacol., 20 (1913), 403.

**Oil of Rhus Cotinus.**—*Characters and Components.* Under the name of "*Essence de Fustet*," Schimmel & Co. recently received a small sample of oil distilled from the leaves and flowers of *Rhus cotinus*, L., the so-called "*Lante fustic*," to which they referred in their April Report of 1910 (see Proceedings, 1910, 320). The small quantity of oil received has permitted only a superficial examination. It consisted of a faintly pale yellowish, almost colorless, oil having the not very characteristic odor of the terpenes—perhaps slightly reminding of neroli—and showed the following constants: Sp. gr., 0.8710; opt. rot., +32° 54'; refr. index, 1.4887; acid val., 0.9; ester val., 20.4; soluble in 6 vols. and more of 95% alcohol. Fractionation showed the oil to consist almost entirely of terpenes, among which camphene, dipentene and limonene were identified. It possibly also contains  $\beta$ -pinene, but the tests for terpinene gave negative results.—Schimmel's Semi-Ann. Rep., April, 1913, 86.

**Italian Samphire Oil.** *Distinctive Characters.*—An examination, by L. Francesconi and E. Sernagiotto, of Italian samphire oil, which came from the Island of Sardinia, has shown it to have a different constitution from French samphire oil (from *Crithmum maritima*, L.), the constituents of which are known up to the present to be *d*- $\alpha$ -pinene, dipentene, *p*-cymene, dillapiol, and thymol methyl ester. The Sardinian oil had been obtained by distillation of the (green?) entire plant in a yield of 0.16%. It was of a reddish yellow color, had an odor reminding of parsley, gave a faintly acid reaction,

and showed the following constants: Sp. gr.  $20^{\circ}$ , 0.9816; opt. rot.,  $+3.18^{\circ}$ ; refr. index, 1.4978; sapon. val., 6.5; ester val. after acetyl., 11.24. Subjected to chemical examination, it was shown to contain 3-phellandrene, *p*-cymene, and a new body which the authors have named

**Crithmene.**—This body, which was obtained from the higher boiling fractions of the oil, possesses the following properties: b. p.  $178^{\circ}$ – $180^{\circ}$  (759 Mm.); sp. gr.  $1.2^{\circ}$ , 0.8679; refr. index, 1.4806. It yields an  $\alpha$ -nitrosochloride (m. p.  $101^{\circ}$  to  $102^{\circ}$ ) and a  $\beta$ -nitrosochloride (m. p.  $103^{\circ}$  to  $104^{\circ}$ ). No solid tetrabromide was obtained. The formation of *trans*-terpinene dihydrochloride (m. p.  $52^{\circ}$ ), when hydrochloric acid gas was passed into the acetic solution of a nitrogenous derivative, showed crithmene to be a derivative of *p*-cymene. Schimmel's Semi-Ann. Rep., October, 1913, 94; from Atti R. Accad. dei Lincei, Roma (5), 22, 1 (1913), 231, 312, 382.

**Oil of Spruce Wood.**—*Source and Properties.*—The "Perfumery and Essential Oil Record" (Jan., 1913) mentions that "spruce wood oil" is a product of the manufacture of spruce wood spirit by the sulphite-cellulose process. It collects in the middle of the fractionating column, and is a reddish brown liquid of peculiar odor. Distilled in a current of steam, a white crystalline substance, having the odor of camphor, collects in the condenser; the composition of this solid is  $C_{10}H_{16}OH$ , and it melts at  $207^{\circ}$ , sublimes at  $190^{\circ}$ , and is optically inactive. It may either be inactive borneol or a mixture of this with isoborneol. Pharm. Journ. and Pharmacist, Jan. 25, 1913, 96.

**Thymol.**—*Medicinal Use.*—The possible use of thymol dissolved in liquid petrolatum. While the petrolatum would dissolve the thymol it would not facilitate its absorption, because it is not itself absorbable and the thymol would need to pass through a watery liquid, in which it is only slightly soluble, before it could reach the blood.—J. Am. M. Assoc., v. 60, 1814. (M. I. W.)

**Oil of Turpentine.**—*Case of Poisoning.*—J. Douglas Blackwood reports a case of turpentine poisoning from the ingestion of 55 minims of oil of turpentine within 24 hours. The patient presented a scarlatinoid rash in addition to the ordinary symptoms of turpentine poisoning, forty-eight hours after the ingestion of the drug.—J. Am. M. Assoc., 1913, v. 61, 412. (M. I. W.)

**Spanish Verbena Oil.** *Constituents.* Spanish verbena oil, which is derived from *Verbena triphylla*, L'Herit. (*Lippia citriodora*, H. B. et K.), and is a product which shows a wide range of differences in its physical and in its chemical characters, has so far been only imperfectly investigated in respect to its chemical constitution—citral and verbenone being the only constituents prominently mentioned in the literature, and others only in a general way. Having now come into possession of some guaranteed genuine oil from Spain, Schimmel & Co. have considered it desirable to investigate those constituents of the oil which had hitherto been disregarded, and report their results which appear in abstract below:

The physical properties of the oil were as follows: Sp. gr. 15°, 0.9239; opt. rot.,  $-5^{\circ} 25'$ ; refr. index, 1.49047; soluble in 1 vol. and more of 80% alcohol; odor resembling lemon-grass oil. The chemical examination established that the Spanish verbena oil investigated contained: from 10 to 15% of *l*-limonene; traces of cineol; about 30% of aldehydes and ketones consisting of methylheptonone, citral and, at most, 0.5% of verbenol; about 10% of alcoholic constituents, including *d*-citronellol and an alcohol of characteristic odor (resembling that of cypress oil) which reacted with phthalic anhydride; and that the chief portion of the oil consisted of 40 to 45% of sesquiterpene compounds (a hydrocarbon and an alcohol). Schimmel's Semi-Ann. Rep., October, 1913, 105-107.

**Volatile Oil of Witchhazel.** *Chemical Examination.*—Some years ago, Hooper Albert Dickinson Jowett and Frank Lee Pyman had occasion to examine a sample of the volatile oil of witchhazel (*Hamamelis virginiana*, L.), the results of which they have now published in a paper presented to the British Pharmaceutical Conference, 1913. The only previous investigation of the oil was carried out by Wilbur L. Scoville (see Proceedings, 1907, 448), who had examined two samples of the oil obtained from the crude distillate, which showed the following characteristics: Specific gravity at 25°, 0.8984 and 0.8985; refractive index (at 20°), 1.4830 and 1.4892; optical rotation,  $+4.6^{\circ}$  and  $+5.05^{\circ}$ ; and saponification equivalent, 3.80 (after acetylation 30.3). The greater portion of the oil distilled between 250° and 263° C. Ten volumes of official alcohol (sp. gr. 0.816) were required for solution at 25°. Scoville concluded that the oil consists chiefly of a terpene with 7 per cent. of an alcohol and a smaller amount of an ester. The present



authors' results agree, on the whole, fairly closely with these, and they find that the chief constituent is a sesquiterpene having the sp. gr. 0.8970, opt. rot.  $+14.88^{\circ}$ , and refr. index 1.4916. A trace of a phenolic substance, a mixture of fatty acids in the free and combined state, and a mixture of solid saturated hydrocarbons were also isolated, while indications of the presence of other compounds, including oxygenated substances, were also obtained.

The authors then describe the experimental work upon which their conclusions were based. The oil employed was specially prepared from pure witchhazel twigs. It is present in a minute proportion only, and consequently the amount available for this examination was very small (43 grams). The oil was golden brown in color, had the sp. gr.  $^{15^{\circ}}_{15^{\circ}}$  of 0.9001, and the optical rotation of  $+4.29^{\circ}$ . It was sparingly soluble in 90 per cent. alcohol, and when mixed with a little absolute alcohol gave a small quantity of colorless precipitate. It contained 0.6 per cent. of acids calculated as acetic acid, and 7.3 per cent. of esters calculated as  $C_{10}H_{17}.C_2H_3O_2$ . No solid compound was obtained with sodium bisulphate solution, nor basic matter by treatment with 10 per cent. sulphuric acid. The oil was shaken out five times with a 5 per cent. solution of  $Na_2CO_3$ . The alkaline liquid was concentrated, acidified with sulphuric acid, and distilled with steam until 1 liter had passed over; the distillate and residue were then separately extracted with ether, and gave fractions A and B, respectively, which served as material for the further study of the oil.—*Trans. Brit. Pharm. Conf. (Yearbook of Pharmacy)*, 1913, 500-505.

**Oil of Wormwood.**—*An Abnormal Specimen.*—For more than half a century wormwood has been cultivated and distilled in Sauk County, Wisconsin, by three generations of the Drew family. Several years ago a sample of oil of wormwood was left at the laboratory of Professor Kremers, at Madison, by Mr. Leander Drew. This sample of about a pound had been set aside by Mr. Drew because of its unusual density, for which he could not account, though in other respects it resembled the general run of oil of the same still and season. Mr. R. C. Roark has now examined this oil. Its specific gravity at  $21.5^{\circ}$  was found to be 1.000, the usual density of wormwood oil being supposed to vary between 0.925 and 0.955. The usual chemical examination, however, revealed the interesting fact that this oil contained salicylic acid, the presence of which is unaccountable,



since none of the other oils distilled semi-occasionally on the Drew farm are supposed to contain salicylic acid; neither are any of the weeds on the farm known to contain salicylic acid. — Journ. A. Ph. A., July, 1913, 841-842.

**American Wormseed Oil.**—*Adulteration with Cineol.*—Schimmel & Co. have examined a suspected sample of American wormseed oil and found it to be heavily adulterated with cineol (eucalyptol). The constants of this sample were as follows: Sp. gr., 0.9571; opt. rot.,  $-2^{\circ} 49'$ ; refr. index, 1.46856; acid val., 0; ester val., 3.7; soluble in 1.8 vols. and more of 70% alcohol. Of a control sample of oil of good quality, 20% boiled between  $40^{\circ}$  and  $48^{\circ}$  (3 to 4 Mm.), but of the adulterated sample the same fraction amounted to 50%, and from this, by repeated distillation, they succeeded in isolating a considerable proportion of eucalyptol (about 25%).—Schimmel's Semi-Ann. Rep., October, 1913, 107.

**Manila Ylang-Ylang Oils.**—*Classification.*—Proceeding on the basis of numerous analyses carried out in the laboratory of the firm of Santos & Jahrling, in Manila, Jahrling has made an attempt to classify ylang-ylang oils. He mentions at the outset that in testing ylang-ylang oil regard must be had to sp. gr., solubility, rotation, refraction, and saponification value. According to his observations, the sp. gr. varies (in different oils) from 0.925 to 0.975, but occasionally exceeds the latter limit, and it increases as the oils age. From 0.5 to 1 Cc. of alcohol is required for the solution of 1 Cc. of oil, the strength of the alcohol varying according to the quality of the oil from 80 to 96% (by volume?). When more alcohol is added, turbidity invariably ensues, owing to the presence of terpenes and sesquiterpenes. It is important to note whether this manifestation is or is not accompanied by separation of oil. In the case of high-class oils no such separation is said to take place even when 80% alcohol is used. Rotation, index of refraction, and saponification values also vary according to the quality of the oils (which are presupposed to have the odor characteristic of Manila oils), and the author utilizes these differences for the purpose of the following classification:

Quality.	Extra.	I.	I <sup>b</sup> .	II.
Optical rotation.....	below $-35^{\circ}$	below $-48^{\circ}$	below $-60^{\circ}$	over $-60^{\circ}$
Index of refraction ..	below 1.4900	below 1.4950	below 1.4990	over 1.4990
Saponification value.	over 145	over 120	over 100	100 or less
Solubility.....	in 80% alc.	in 90% alc.	in 90-96% alc.	in 96% alc.

Schimmel & Co. criticize the proposed classification of Jahrling

unfavorably and on the ground of their own extensive experience, they are unable to accept it (see their Report).—Schimmel's *Semi-Ann. Rep.*, October, 1913, 109–110; from *Rev. gén. de Chim.*, 16 (1913), 43.

#### ALCOHOLS AND DERIVATIVES.

**Fucitol.**—*A New Alcohol from Fucose.*—According to E. Votocek and R. Potmesil, fucose, the sugar obtained from bladder-wrack, *Fucus vesiculosus*, when reduced with sodium amalgam, is converted into the alcohol fucitol. This new alcohol crystallizes from ethyl alcohol in silvery leaflets which melt at  $153^{\circ}$ – $154^{\circ}$  C. Rhodoseose and fucose are stereoisomers, and the corresponding alcohols, fucitol and rhodicitol are, respectively, levo- and dextro-rotatory to the same degree. By mixing the two alcohols in equimolecular proportions in hot alcohol, racemic fucitol is obtained. *Pharm. Journ. and Pharmacist*, December 20, 1913, 911; from *Berichte*, 46 (1913), 3653.

**Alcohol.**—*Determinations by the Pharmacist.* C. W. Miller says that determinations of alcohol content are not difficult; that every pharmacist should be able to make them, and makes interesting suggestions to assist the inexperienced analyst in such manipulations. *Proc. Md. Phar. Assn.*, 1913, 90–92. (E. C. M.)

**Ester Assay of Cherry Brandy.** L. Sobel presents a paper on this subject designed particularly to show that the ester standard of the Swiss government for brandy is not correct. He backs up his opinion by a table showing analyses of 16 samples. *Schweiz. Wschr. f. Chem. u. Pharm.*, 51, (1913), No. 41, 613. (H. V. A.)

**Alcohol.**—*Use as a Food.* To say that alcohol may be a food is not to deny that it is a dangerous one. If it is given too freely its oxidation is incomplete and, what is more important, the untoward nervous effects become prominent. In ordinary conditions of health there is no occasion for the use of alcohol, and its introduction into the regimen of daily life can scarcely be defended on the grounds of nutritive needs. *J. Am. M. Assoc.*, 1913, v. 61, 966–967. (M. I. W.)

**Alcohol.** *Effects of Intoxication.* Matthew Wood reports seven cases of epilepsy in children traced to single alcoholic intoxications on the part of one or both parents otherwise teetotalers. He believes that alcohol produces important changes in the ingredients of vital fluids, as well as secretions, and, therefore, also influences or

changes the constituents of the seminal fluid, paralyzing temporarily and otherwise altering the spermatozoa as it does the corpuscles and serum, so that we might hazard the conjecture that it is not so much chronic drunkenness, as drunkenness at the time of conception, that causes the transmittal of an often overwhelming neurosis to offspring.—J. Am. M. Assoc., 1913, v. 61, 2291-2292. (M. I. W.)

**Aldehydes.** *Toxicity.* Although formaldehyde is the most used of aldehydes, there are others which are not so generally known and which may at times cause serious harm. Loeb has investigated the effects of a large number of aldehydes on experimental animals and found that aldehydes of the fatty acid series generally cause arterial changes in rabbits, entirely similar to the experimental arteriosclerosis produced by epinephrine.—J. Am. M. Assoc., v. 60, 756. (M. I. W.)

**Aluminum Ethylate.** *Preparation.*—C. Berger observes that although aluminum amalgam decomposes water in the cold like an alkali metal, under ordinary conditions it does not easily displace hydrogen in the molecule of ethyl alcohol. When heated with absolute alcohol, there is only a slight evolution of hydrogen, and a small amount of alumina may be precipitated ultimately from the solution. If, however, a little sodium ethylate be present in the alcohol, such as is formed by the action of a minute quantity of sodium, before the aluminum amalgam is introduced, a slight reaction takes place as soon as the latter comes in contact with the liquid. On heating under a reflux condenser it becomes brisk, and may be continued until a saturated solution of aluminum ethylate ( $C_2H_5O)_3Al$  is obtained. The compound may be obtained in a solid form by evaporation *in vacuo*. It is very readily decomposed by moisture, with the formation of alumina and regeneration of ethyl alcohol, consequently the presence of any trace of water must be avoided during the experiment. The solid ethylate is also decomposed by heat.—Pharm. Journ. and Pharmacist, November 22, 1913, 773; from Compt. rend., 157 (1913), 717.

**Ethyl Ether.** *Contamination with Foreign Ethers.*—In the course of molecular determinations of ethyl ether, G. Frerichs found that the ether used for the experiment showed irregularities, which could be accounted for only by contamination with substances having a lower boiling point. As such contaminants, the most plausible are methyl-ethyl ether and acetone derived from im

purities in the alcohol employed for its preparation, the presence of which is demonstrated by the more or less pronouncedly lower boiling point of the ether under examination. Incidentally, the author has demonstrated by the aid of a specially contrived arrangement that the boiling point of pure ether is not  $35^{\circ}$ , as officially stated, but is from  $34.2^{\circ}$  to  $34.3^{\circ}$ . Taking these corrections into consideration, if the boiling point of the ether is only a little below these figures, the presence of methyl-ethyl ether is demonstrated by the following test:

From 250 Cc. of ether, the boiling point of which has been ascertained, 50 Cc. are distilled and its boiling point is determined in the same way and with the same thermometer as in the original sample. If the boiling point of the distillate is markedly lower than that of the latter, the presence of methyl-ethyl ether is indicated.

The presence of acetone, on the other hand, is more conveniently determined as follows:—About 100 Cc. of the ether are vigorously shaken in a separatory funnel with 10 Cc. of water. After subsidence, the water is run off and divided into two portions. To one portion, 10 drops of solution of sodium nitroprusside, 6 drops of sodium hydroxide solution, and 15 Cc. of water are added, and the mixture is then acidulated with diluted acetic acid (C. P.). If the mixture is not nearly colorless, but shows a reddish or violet color, acetone is present. To the second portion, 5 Cc. of ammonia solution and 1 or 2 Cc. of tincture of iodine are added, and the mixture is heated (with the possible addition of a little more ammonia solution) until the black precipitate of nitrogen iodide disappears and the liquid becomes light yellow and clear. In the presence of acetone, a yellow crystalline deposit of iodoform will then form on cooling.—Apoth. Ztg., xxviii, (1913), No. 65, 628-630.

**Ether Percentages.**—Walter M. Boothby describes with illustrations an apparatus for determining ether percentages that are obtained by passing air over liquid ether. From a calculation of the loss of heat directly attributable to warming anæsthetic vapors, it is demonstrated that such loss is negligible in comparison to that from the body surface. Consequently it is futile to warm the anæsthetic vapors. J. Am. M. Assoc., 1913, v. 61, 830-834. (M. I. W.)

**Chloroform pro Narcosi.**—*Care in Stoppering with Cork.*—In the storage of chloroform, which has been carefully examined and found unexceptionable in quality for producing narcosis, the mistake



is not infrequently made to stopper the "nearly completely filled" brown bottles with corks which are not free from fissures or small depressions, from which small, almost invisible particles of cork, substance may fall into the chloroform. It may then occur that when the sulphuric acid or sulphuric acid-formaldehyde test is applied, the chloroform, though suitable for producing narcosis, is rejected because of the color reaction resulting. If, therefore, cork stopperage is resorted to, the corks should be carefully examined, and only such used as are absolutely free from the imperfection mentioned. Moreover, even in this case, the under end of the cork, reaching into the neck of the bottle, should, as additional precaution, be covered with parchment paper. It is scarcely necessary to add that this extra care is avoided if accurately fitting glass stoppers are used.—Pharm. Ztg., lviii, (1913), No. 19, 191.

**Chloroform.** *Test of Purity and Method of Purification and Preservation.* Th. Budde, staff-apothecary in the Prussian War Department, recommends benzidine as an extremely sensitive reagent for the presence of phosgen, hydrochloric acid and free chlorine in chloroform, and superior to all other reagents hitherto proposed for this purpose. If to about 10 Cc. of the chloroform a few crystals of benzidine are added, the crystals quickly dissolve on gently rotating, forming a clear solution. If the chloroform is pure and undecomposed, this solution remains unchanged after 24 hours if preserved in the dark; but decomposed chloroform is rendered turbid at once in the presence of phosgen and hydrochloric acid, while free chlorine is indicated by a blue coloration. The author finds benzidine also useful for the detection of other impurities in the chloroform. He recommends also that purified chloroform for inhalation should contain exactly 0.6 per cent. of absolute alcohol, not 0.6 to 1.0 per cent. as permitted in the G. P. Furthermore, after carrying out the usual methods of purification—washing with water, treatment with concentrated sulphuric acid, washing with water, then with dilute sodium carbonate, again water, and finally drying with granulated calcium chloride—the chloroform should be distilled in a current of carbonic acid. The chloroform should distill completely between 60° and 62°, and to the distillate the necessary quantity of absolute alcohol (0.6:100.0) added. A special enactment of the War Department requires that chloroform for inhalation must be preserved in graduated glass-stoppered vials of 30 Cc. capacity, which must be completely filled, and sealed with a mixture of the following composition: Gelatin, 30.0; glycerin, 20.0; zinc oxide, 10.0; distilled

water, 100.0. The object of the zinc oxide is to recognize imperfections in the coating. Purified and preserved in this way, the chloroform apparently remains unchanged for an indefinite time. —Pharm. Ztg., lviii (1913), No. 54, 532.

**Chloroform.** *Miscibility with Alcohol.*—According to G. P. V chloroform is soluble in alcohol in all proportions. It has been pointed out, however, and is confirmed by the investigations of Karl Enz, that this is not in accord with actual fact. Thus he finds that a clear mixture of chloroform and the official 90 per cent. alcohol (sp. gr. 0.830–0.834) is not obtainable with less than 3 parts of the alcohol to 10 parts of the chloroform. The actual experiments show that as the alcohol increases in strength the amount required for clear solution is reduced until the specific gravity 0.811 is reached, which fixes the limit. With alcohol of this strength no turbidity is produced on addition of 0.1 Cc. to 10 Cc. of chloroform; 0.2 Cc. produces a turbidity which disappears on shaking, 0.3 Cc. the same, but 0.4 Cc. is clearly miscible at once, as are all other proportions of the same alcohol.—Pharm. Ztg., lviii (1913), No. 83, 828.

**Paraldehyde.** *Stability by Itself and in Mixtures.*—In the course of studies on the G. P. V tests for paraldehyde with the view of their possible correction, extending over a period of several years, R. Richter devoted particular attention to the stability of the drug, both when kept by itself in the shop and in its admixtures such as are commonly prescribed, such as water, pure and acidulated, fruit juices, etc. The results of these studies and experiments, which he describes in detail, have led him to the following conclusions: (1) Pure paraldehyde, free from acid and acetaldehyde, possesses marked stability, so that it may be kept in an unchanged condition for more than a year even when kept in a partly filled, cork-stoppered bottle, or at most with only insignificant conversion into acetaldehyde; but in the presence of acid or acetaldehyde slow decomposition results, so that, as recently mentioned by Heyl, it is not advisable to keep the paraldehyde in stock longer than one year. (2) With pure raspberry juice without addition of water, the paraldehyde will keep unchanged several months. (3) In mixtures with water and addition of acidulated juice, the paraldehyde is quickly and progressively reconverted into acetaldehyde. (4) In aqueous solution without the addition of juice, the reversion of the paraldehyde into acetaldehyde takes place slowly, but steadily.—Pharm. Ztg., lviii (1913), No. 49, 482.

**Methyl Alcohol.** *Natural Occurrence in Ivy and in Euonymus Leaves.*—Maurice Nicloux found in fresh ivy leaves up to 0.37 Gm. and in fresh euonymus(?) leaves up to 0.45 Gm. of methyl alcohol pro Kgm. He regards the formation of this alcohol as being possibly due to decomposition of carbonic acid. Traces of ethyl alcohol were also found.—Pharm. Ztg., lviii (1913), No. 92, 922; from Bull. Soc. chim. de France, 1913, 339-943.

**Methyl Alcohol.** *Relative Toxicity.* The close chemical relationship and the similarity in physical properties and behavior of methyl and ethyl alcohol, the two chemical compounds which form the essential ingredients of wood alcohol and of grain spirits, respectively, have made it difficult to believe that they could be so distinct and unlike in respect to their toxicity. Langgaard of Berlin has contributed new demonstrations of certain significant facts in relation to the two alcohols, to the probability of which earlier comments have already pointed. In small, frequently repeated doses methyl alcohol is far more poisonous than is ethyl alcohol. A single large dose of the latter may, however, provoke a more toxic manifestation than does methyl alcohol. It would appear as if methyl alcohol, administered in small repeated quantities, brings about a cumulative effect.—J. Am. M. Assoc., 1913, v. 61, 126. (M. I. W.)

**Methyl Alcohol.** *Cause of Toxicity.* It has been pointed out that inasmuch as methyl alcohol is in part oxidized to formic acid in the body, this oxidation product may be an immediate cause of the toxic symptoms. Recent work by Krol and others clearly shows that acidosis in cases of methyl alcohol poisoning is a factor which deserves to be taken into account in a consideration of the phenomena of poisoning by this drug.—J. Am. M. Assoc., v. 61, 1544. (M. I. W.)

**Methyl Alcohol.** *Detection.* Ever since the Berlin catastrophe the German chemists have been busy in originating and perfecting new methods for the detection of methyl alcohol. Dr. Roland Schmiedel of Stuttgart, in a lengthy paper, reviews the most important methods, and also contributes a new one, in which hydrogen peroxide is employed to oxidize methyl alcohol into formic acid, and ethyl alcohol into acetic acid. Formic acid can easily be determined in this solution by its well-known property of reducing mercuric chloride to mercurous chloride or calomel, which can be determined gravimetrically. 1 Gm. calomel = 0.0975 Gm. of formic acid, or 0.0678 Gm. of methyl alcohol. The author recommends



this method, which is given in detail in the original paper, especially for the determination of small quantities of methyl alcohol in ethyl alcohol.—Ph. Zhalle., 1913, No. 29. (O. R.)

**Methyl Alcohol.** —*Toxic Effects.*—Despite the considerable literature now available on the subject of methyl alcohol poisoning, very little has been discovered respecting the relation of this substance to the blood. The toxic effect is made evident in this direction as well as in connection with other more striking phenomena. From experiments by Miura, the blood-forming functions appear to be seriously affected by the poison. The production of anæmia is a new finding in this connection, and the decrease in the circulating lymphocytes with simultaneous increase in certain other types of leukocytes points to an involvement of the hemopoietic system. The attending albuminuria and urobilinuria are likewise not insignificant symptoms. Whether these pathologic phenomena are brought about by methyl alcohol itself or only by oxidative derivatives such as formaldehyde or formic acid is of secondary import here. Methyl alcohol introduced into the organism means physiologic trouble.—J. Am. M. Assoc., v. 60, 1467. (M. I. W.)

**Wood Alcohol.** —*Ignorance Regarding Its Toxicity.*—In spite of numerous warnings published in medical, pharmaceutical and lay periodicals, it is strange that so much ignorance is still displayed regarding the toxicity of methyl or wood alcohol. This lack of knowledge, or perhaps of wisdom, is shown in some quarters in which it ought to be least expected. For example, the New York Board of Health a few months ago passed the following ordinance: "No preparation or mixture containing methyl alcohol intended for external use by man, or so used, shall, when offered for sale, sold or used, be especially labeled, as follows: 'This preparation contains methyl (wood) alcohol.' " If the foregoing means anything it permits a virulent poison to be sold to the ignorant public without a specific notice of its toxic quality.—J. Am. M. Assoc., v. 60, 1231-1232. (M. I. W.)

**Wood Alcohol.** —*Cases of Blindness.*—Hiram Woods reports two cases of blindness, one from the external use and one from the internal use of wood alcohol.—J. Am. M. Assoc., v. 60, 1762-1764. (M. I. W.)

**Methyl Alcohol.** —*Proposed Prohibition of Its Use in Preparations for External Use.* John C. Wallace, having his attention



directed to an effort made to incorporate in the misbranding section of the Pennsylvania Drugs Act a third paragraph to the effect "If It Contain Methyl or Wood Alcohol," subjected this question to comprehensive study in all its relations, and with the facts thus ascertained before him arrives at the conviction that, until more proof is given that the external use of methyl alcohol is dangerous, the proposed legislative regulation, prohibiting its use in preparations for external use only, is not justifiable.—Journ. A. Ph. A., October, 1913, 1263-1264.

**Formaldehyde.** *Some Possible Dangers.*—William E. Morgan calls attention to some of the dangers attendant to the reckless freedom with which formaldehyde and its derivatives are used by hospital employees, surgeons, health boards, undertakers and food preservers. Many persons are peculiarly susceptible to formaldehyde poisoning, the mere presence of the vapor in the room or on the bedclothes of a patient being immediately recognized.—J. A. M. Assoc., v. 60, 590-591. (M. I. W.)

**Solution of Formaldehyde.**—*Specific Gravity.*—R. Richter finds that the specific gravity is not a criterion for the formaldehyde content, owing to the variable amount of methyl alcohol present. The author recommends to omit the specific gravity or to adopt a maximum specific gravity.—Pharm. Ztg., 1913, No. 19. (O. R.)

**Phenol.** *Bromine Water Test of the G. P. V.*—F. Raschig having found that the statement of the G. P. V.—"Bromine water produces even in a solution of 1 part of phenol in 50,000 parts of water, a white flocculent precipitate"—is incorrect, no precipitate of tribromo-phenol being produced at this dilution, O. Anselmino and A. Mandke have now investigated the test carefully with the following results: The limit of the formation of a white precipitate is 1 in 10,000. At dilutions up to about 1 in 38,000, a white turbidity is produced on pouring a drop of bromine water down the side of the test-tube into the phenol solution. After the disappearance of the turbidity a few small crystals appear but do not aggregate into flocks. At dilutions of 1 in 40,000 and 1 in 50,000 no turbidity is formed, but after standing for some time a few yellow crystals of tribromophenylbromide (m. p. 131°) separate out.—Apoth. Ztg., 28 (1913), No. 24, 214.

**Phenol.** *Estimation in Presence of Organic Matter.*—E. M. Mumford observes that for the estimation of phenol in the presence of comparatively large quantities of organic matter, the usual

methods (that based on the formation of the bromine compound, and that on the complete oxidation of the phenol) are unreliable. He now proposes a method which is based on the principle that phenol sulphonic acid is readily nitrated, and that the resulting nitro body, on being made alkaline with ammonia, is changed to ammonium picrate, the yellow color of which lends itself readily to colorimetric estimation. A suitable volume of the phenol-containing liquid is warmed with a few Cc. of concentrated sulphuric acid to  $80^{\circ}$  or  $90^{\circ}$  C.; if this temperature is not exceeded or maintained for more than a minute there is no loss of phenol, but the time is quite sufficient for complete sulphonation of the phenol. Into the warm solution is run a volume of 10 per cent. potassium nitrate solution sufficient to oxidize the organic matter present, while at the same time nitration will be effected. The mixture is warmed, and boiled if necessary, to destroy the organic matter. The boiling is continued till the liquid is straw-yellow in color, or white. It is then cooled, and when rendered alkaline with concentrated solution of ammonia, is matched against a standardized solution of phenol sulphonic acid which has been nitrated and made alkaline in a similar manner. The method is sufficiently accurate for ordinary purposes, and is sensitive enough to estimate 0.0001 Gm. of phenol. It may also be applied to the estimation of  $\alpha$ - and  $\beta$ -naphthols and salicylic acid.—Chem. News, May 30, 1913, 253.

**Di- and Tri-Hydric Phenols.**—*Distinctive Color Reactions.*—O. Schewsket describes distinctive color reactions for the following phenols:

**Pyrocatechol.**—On treating a 1 per cent. solution of pyrocatechol in water with 3 to 5 drops of a 1 per cent. solution of iodine (containing potassium iodide), diluting the mixture with water and adding several drops of 5 per cent. soda solution, a green color is obtained. On standing, or boiling, the liquid becomes brownish, but the green color returns after cooling, or shaking, or the addition of a little hydrogen peroxide. Under similar conditions resorcin and quinol give negative results.

**Pyrogallol.**—(1) A 2.5 per cent. solution of pyrogallol treated with 5 to 10 drops of a 1 per cent. iodine solution, and then diluted with water, gives a transient violet color with a few drops of alkali. (2) 10 Cc. of an aqueous solution with 5 to 10 Cc. of alcohol, cooled, and treated with several drops of alkali gives a gradually develop-

ing permanganate color. These two tests distinguish pyrogallol from phloroglucinol.

**Phloroglucinol.**—(1) A solution of 0.01 Gm. in 5 Cc. of hot water, treated with 5 to 10 drops of a 0.5 per cent. iodine solution decolorizes the latter; but on adding a few drops of alkali a light brown color is produced, which changes to reddish violet on boiling. (2) 5 Cc. of a hot solution of phloroglucinol treated with a few drops of alkali and 5 to 10 drops of hydrogen peroxide gives a persistent blue-violet color, which changes to red and then to yellow if the liquid is acidified, but reappears on further addition of alkali. This is said to be a very characteristic test. *Journ. Soc. Chem. Ind.*, September 15, 1913, 862; from *Biochem. Ztschr.*, 54 (1913), 282.

**Creosote.**—*Antiseptic Constituents.*—Professor Charitschkoff has endeavored to definitely determine the question, as yet undecided, to which of the constituents of creosote its antiseptic action is attributable. For this purpose, the phenolic and acid constituents were removed by alkali, the nitrogenous bases by acids, and the naphthalin, together with some unsaturated compounds, with sulphuric acid. It was found that phenol-free creosote was nearly as antiseptic as the crude creosote, and this was equally true with creosote freed from basic constituents, while the creosote after treatment with sulphuric acid remained also strongly antiseptic. Moreover, the phenols themselves, as well as the isolated bases, possessed the same antiseptic activity as the creosote from which they were obtained. The author conjectures that the antiseptic properties of creosote are not solely dependent on the bodies which exist in it ready formed, but also to the products that are formed by oxidation from the unsaturated compounds. *Pharm. Ztg.*, lviii (1913), No. 99, 990; from *Chem. Ztg.*, 1913, No. 143.

**Cresol.** *Test.* According to the German Pharmacopœia V, cresol is sulphonated with concentrated sulphuric acid and nitrated with crude nitric acid in order to determine the amount of meta-cresol. According to Dr. F. Lehmann it is absolutely necessary to add the nitric acid *all at once* and not in portions, and also to thoroughly agitate the mixture. *Apoth. Ztg.*, 1913, No. 7, 62-63. (O. R.)

**Cresol.**—S. P. Kramer, in discussing the possible source of dangers in the use of antimenigitis serum states that serum con-

taining 0.5 trieresol cannot safely be injected in the subarachnoid space.—J. Am. M. Assoc., v. 60, 1351. (M. I. W.)

**Guaiacol- and Creosol-Acetic Acids.**—*Preparation, Characters and Derivatives.*—At the sixtieth annual meeting of the Association (at Denver), A. R. L. Dohme and H. Engelhardt presented a paper on "Guaiacol- and Creosol-Acetic Acid and Some of their Derivatives," from which the following quotations are in brevity abstracted: Introducing their subject, the authors mention that the attention of chemists and physicians had for years been directed upon creosote from beechwood tar, and in particular upon the principal ingredients of the same, guaiacol and cresol, and their value in the treatment of tuberculosis has been generally admitted. It has been shown by several investigators that creosote is a general and effective germicide, and by Buchholtz in particular that it is at least four times as effective a germicide as phenol, so that, other things being equal, it would naturally be preferred to the latter. But creosote possesses the undesirable property of irritating the mucous membrane of the stomach, and so pronounced is this effect that it is sufficient to practically prevent its use as such internally. It has, therefore, been the aim of chemists to produce compounds of creosote or its chief constituents, guaiacol and creosol, which are non-irritating, and which are easily split up in the system into their components, and which consequently retain their full power, with results that numerous preparations have been manufactured and successfully exploited under trade names well known on the market.

More than fifteen years ago experiments were carried out by the authors in order to produce compounds of guaiacol and creosol which possessed the desirable properties above mentioned, and as a result of these investigations a number of products were obtained which are described in the present paper and mentioned below. Some of these compounds have since been manufactured and described by other investigators, who in some cases used processes differing from those described by the authors, but it must suffice here to mention only that these processes in general consist of the introduction of the guaiacol or creosol radicals into the acetic acid radical, and in preparing from the resulting substituted acids, the various salts, esters, and amides. It must be mentioned also that, unfortunately, as was found out later, the substances described have therapeutically little value, since guaiacol or creosol, unlike those esters of organic or inorganic acids, in which these compounds figure as alcohols, are split off only partially. In brevity, the



compounds described have the following composition and characters:

**Guaiacol-Acetic Acid** ( $C_6H_4.OCH_3.O.CH_2COOH$ ). Long, fine white needles, m. p.  $121^\circ$ , decomposing by continued heating with water into guaiacol and acetic acid; readily soluble in alcohol, ether, benzene, and chloroform.

**Copper Guaiacol-Acetate** ( $C_7H_7O_2.CH.CO O$ ) $_2Cu$ ; crystallizes from water in fine blue needles.

**Lead Guaiacol-Acetate** ( $C_7H_7O_2.CH_2.CO O$ ) $_2Pb$ ; difficultly soluble in water; crystallizes in wart-like masses of colorless needles.

**Silver Guaiacol-Acetate** ( $C_7H_7O_2.CH_2.CO O$ ) $_2Ag$ ; crystallizes from water like the lead salt and is quite sensitive to light.

**Creosol-Acetic Acid** ( $C_6H_3.CH_3.OCH_3.O.CH_2.CO OH$ ). Long white needles, m. p.  $108^\circ$ ; sparingly soluble in water; readily soluble in the usual solvents.

**Potassium Creosol-Acetate** forms long, fine white needles when crystallized from water; readily soluble in hot water; difficultly soluble in alcohol.

The *Copper Salt* is difficultly soluble in water; forms blue wart-shaped crystals. The *lead salt*, which crystallizes similarly, is readily soluble in water. The *silver salt* crystallizes in groups of colorless needles and lamellæ, is soluble in water, and quite sensitive to light.

**Guaiacol-Acetic Acid Ethyl Ester** ( $C_6H_4.OCH_3.O.CH_2.CO OC_2H_5$ ). A light yellow heavy oil, boiling when redistilled at  $270^\circ$ – $271^\circ$ , and possessing a pleasant cinnamon-like odor. Insoluble in water; easily soluble in alcohol and ether.

**Creosol-Acetic Acid Ethyl Ester** ( $C_6H_3.CH_3.OCH_3.O.CH_2.CO OC_2H_5$ ). Similar to the guaiacol compound, but more distinct, pleasant, aromatic odor, and the same solubilities. It boils at  $276^\circ$ – $277^\circ$ .

**Guaiacol-Acetic Acid Amide** ( $C_6H_4.O.CH_3.O.CH_2CONH_3$ ). Crystallizes in fine white crystals arranged in fan-shaped clusters; m. p.  $138^\circ$ ; colorless and odorless; soluble in hot water, alcohol, and ether.

**Creosol-Acetic Acid Amide** ( $C_6H_3.CH_3.OCH_3.O.CH_2NH_2$ ). Fine, white, odorless and tasteless needles; m. p.  $127^\circ$ ; solubilities the same as the corresponding guaiacol compound, and like the latter is saponified by caustic alkalies.

A list of the corresponding compounds of other phenols (phenol, naphthol, thymol, etc.), giving their melting and boiling points, is appended to this paper.—Journ. A. Ph. A., March, 1913, 293-296.

**Resorcin.**—Douglass W. Montgomery reports an instance of unusual sensitiveness to resorcin. An ointment containing about 3.25 per cent. of resorcin caused a violent reaction and even when reduced to one-half the strength made the patient so ill that he refused further treatment.—J. Am. M. Assoc., v. 60, 2035-2037. (M. I. W.)

**Nitroglycerin.**—*Action of Heat.*—According to W. O. Snelling and C. G. Storm, nitroglycerin begins to decompose at temperatures as low as  $50^\circ$  or  $60^\circ$  C. At  $70^\circ$ , the commercial product evolves enough nitrous fumes to give a decided test with potassium-iodide starch paper at the expiration of fifteen to thirty minutes. It tends at very low temperatures to be somewhat volatile, and slowly loses weight at ordinary room temperatures. At somewhat higher temperatures, both decomposition and evaporation increase. At about  $135^\circ$  C., the decomposition is so rapid as to cause the liquid to become of a strongly reddish color, owing to the absorption of the nitrous fumes resulting from that which is decomposed; at  $145^\circ$ , ebullition begins, and the liquid "boils" strongly. The "boiling" is due partly to evolution of decomposition products (mainly oxides of nitrogen and water vapor) and partly to actual volatilization of nitroglycerin itself. Between  $145^\circ$  and  $215^\circ$  ebullition becomes more violent, and at about  $218^\circ$  C. it explodes.—Chem. News, January 24, 1913, 43.

**Nitroglycerin.**—*Caution.*—Edward E. Cornwall says nitroglycerin should never be used for the primary purpose of a heart stimulant. When given under the tongue it produces almost as prompt an effect as when injected under the skin. The chief contra-indications to the use of nitroglycerin are (1) low or relatively low blood-pressure; (2) advanced chronic nephritis with very high blood-pressure and toxemic conditions producing high blood-pressure, as a rule; and (3) the presence of an idiosyncrasy in regard to its action.—J. Am. M. Assoc., 1913, v. 61, 118-120. (M. I. W.)

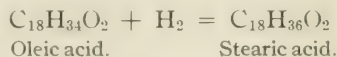
**Calcium Glycerophosphate** is monohydrated calcium glycerophosphate,  $\text{Ca}(\text{CH}_2\text{OH}.\text{CHOH}.\text{CH}_2)\text{PO}_4\text{H}_2\text{O}$ , the normal calcium salt of glycerophosphoric acid,  $\text{H}_2(\text{CH}_2\text{OH}.\text{CHOH}.\text{CH}_2)\text{PO}_4$ , containing not less than 90 per cent. of anhydrous normal calcium glycerophosphate. Calcium glycerophosphate occurs as a fine white powder, odorless and almost tasteless; somewhat hygroscopic. It is slightly (about 1-400) soluble in water, almost insoluble in boiling water; easily soluble in dilute acids; insoluble in alcohol or in ether.—J. Am. M. Assoc., v. 60, 45. (M. I. W.)

**Sodium Glycerophosphate** is described as hydrated sodium glycerophosphate,  $\text{Na}_2(\text{C}_2\text{H}_5(\text{OH})_2\text{PO}_4 \cdot 5\frac{1}{2}\text{H}_2\text{O})$ , the sodium salt of monoglycerophosphoric acid,  $\text{H}_2(\text{C}_2\text{H}_5(\text{OH})_2\text{PO}_4$ , containing not less than 99 per cent. of hydrated sodium glycerophosphate. White, monoclinic plates or scales, having a saline taste; odorless; easily soluble in cold and hot water; nearly insoluble in alcohol. At about  $60^\circ \text{C}$ . ( $140^\circ \text{F}$ .) it begins to lose its water of hydration; when strongly heated the salt yields inflammable vapors and at a red heat is converted into sodium pyrophosphate.—J. Am. M. Assoc., v. 60, 442. (M. I. W.)

#### FIXED OILS AND FATS.

**Fats, Oils, and Waxes.**—*Decolorization with Kieselguhr.*—According to "La Nature," the simplest and most effective process for the decolorization of fats, oils and waxes consists in the use of fossil meal (kieselguhr). This substance acts by reason of its extraordinary porosity; the total surface of the elements contained in a ton of fossil meal exceeds sixteen million square meters. All the pores are filled with air, which in this form is extremely divided and possesses enormous oxidizing power. The fatty materials which may be decolorized by it are the petroleumcs, paraffin, vaseline, ozokerite, and ceresine; tallow, lard, and bone fat; whale oil, cod-liver oil; linseed, coconut, palm, poppy, cottonseed and rape oils. Mineral fatty substances are first heated to  $100^\circ$ - $150^\circ \text{C}$ ., animal fats to  $80^\circ$ , while the vegetable oils may be decolorized at the ordinary temperature; 2 to 5 per cent. of kieselguhr is added, and the mixture stirred for half an hour; the mixture is allowed to deposit, and the supernatant liquid decanted. Not only is the decolorization sometimes complete, but there is often considerable deodorization as well, and, besides, animal oils and fats that have undergone this treatment become rancid much less easily than before treatment.—Pharm. Journ. and Pharmacist, June 14, 1913, 839; from La Nature, March 29, 1913.

**Fats.**—*Method of "Hardening."*—Labadier and Senderens observe that for many years one of the chief problems of the oil industry has been to obtain a harder material from soft fats. The chemical problem involved in the ideal process is the addition of hydrogen to unsaturated fatty acids or their glycerides, as represented in the case of oleic acid by the equation:



All attempts to make the hydrogen combine with the unsaturated compounds proved unsuccessful until the authors discovered that the combination could be effected by bringing the hydrogen and liquid fat together at high temperatures in the presence of finely divided nickel, which acts as a catalytic agent. Other processes have since been developed, using cobalt, palladium or platinum in place of nickel. In each case solid products resembling lard or tallow are obtained, that from whale oil being a hard, white tallow-like fat melting at  $45.1^\circ \text{C.}$ , and that from earthnut oil closely resembling lard in its chemical properties. These fats are now sold as food products and it has been ascertained that they contain no injurious substances, provided all trace of nickel is eliminated. Only liquid fats, already fit for human food, however, should be used as raw materials, such fats as bone fat and whale oil being kept for the manufacture of soaps and candles.—*Pharm. Journ. and Pharmacist*, Jan. 25, 1913, 97; from *Knowledge*, January, 1913, 21.

**Hardened Oils.**—*Analytical Constants and Tests.*—W. Normann and E. Hügel observe that the hardening of oils by reduction necessarily decreases the proportion of unsaturated bodies, and therefore lowers the iodine number. The extent to which hydrogenization takes place differs in different processes, and thus the same oil may, after hardening, possess various iodine numbers, according to the method by which it has been treated. As the degree of saturation increases the specific gravity rises, until it almost reaches the figure for tristearin—*e. g.*, a hardened cottonseed-oil (iodine number 0) had a specific gravity of 0.9999 at  $15^\circ$ ;  $15^\circ$ —tristearin = 1.0101. The melting point rises, with hardening, to different maximum values, according to the proportion of hydroxyl in the fatty acids present. The refractive power is also considerably altered, while the saponification value, the free fatty acid, and the unsaponifiable matter are practically unchanged. The hardening is accompanied by the removal of hydroxyl groups, and the hydroxyl



number consequently falls, *e. g.*, the hydroxyl number of castor oil fell from 156 to 102 in one case and to 131 in another. Hardening may also affect the color reactions of oils. Halphen's and Becchi's tests for cottonseed oil are unreliable if any considerable hardening has taken place, but the Baudouin test for sesame oil is not interfered with; indeed, it appears to become more distinct. The unsaturated fatty acid test for train oils becomes worthless, but the proportion of the saturated arachic and behenic acids is increased. The erucic acid of red oil is similarly changed to behenic acid. The test described by Kreis and Roth (*Chem. Ztg.*, 1913, 58) gives reliable indications of the presence of hardened arachis, train and red oils, but does not show if these are present alone or mixed with other fats. Train oil may be distinguished from arachis and red oils by Bömer's cholesterin test.—*Chem. Ztg.*, 81 (1913), 815.

**Animal and Vegetable Oils.**—*Modification of Bömer's Test for Their Distinction.*—According to Salkowski, all animal fats contain *cholesterol*, and all vegetable fats *phytosterol*. Bömer's method of distinguishing oils or fats of the two kinds depends on this difference, the alcohols being distinguished by their crystalline form and the melting points of their acetates; but the disadvantages of the method, which requires the saponification of the fats, are the length of time required, the large quantity of alcohol and ether used, and the difficulty of purifying the alcohols obtained. Prof. J. Marcusson and Dr. H. Schilling now propose a modification of this test, which is based upon the observation of Windhaus that both cholesterol and phytosterol form characteristic compounds (digitonides) with *digitonin*, which is far simpler and quicker, and gives quite satisfactory results. By this modification it is not necessary to saponify the fats at all, and, although the cholestrin in a fat is usually much less than 1 per cent., it will form the characteristic compound with digitonin without previous saponification. The details of the method are given; and the results obtained with a large number of fats and oils and their mixtures showed that when properly carried out as little as 5 per cent. of a vegetable oil in an animal oil could be reliably detected.—*Pharm. Journ. and Pharmacist*, November 22, 1913, 772.

**Fixed Oils.**—*Saponification without Heat.*—Having occasion to determine the saponification number (Koettstorfer number) of several samples of linseed oil, G. N. Watson found it necessary to leave some of them over night before completing the operation.

All the samples had been treated with N. 2 alcoholic KOH (25 Cc.)—some of them having been heated the prescribed half hour, and some not. While titrating the samples with N. 2 HCl the next morning, he titrated a few of the unheated samples before discovering his mistake. Upon redetermining the saponification values of these samples by the usual method, he was surprised to find that the results by both methods checked very closely. To get further light upon the subject, other fixed oils were saponified both with and without the application of heat. The results of the investigation are as follows:

CC. OF N/2 KOH CONSUMED IN SAPONIFICATION OF 2 CC. OF OIL.

	Hot, $\frac{1}{2}$ Hr.	Cold, 16 Hrs.
Lard oil.....	15.64	15.64
Castor oil.....	13.22	13.12
Exp. oil of almond.....	13.98	14.04
Oil of poppy.....	13.83	13.83
Cocoonut oil.....	18.76	18.76
Olive oil.....	13.93	13.93
Sesame oil.....	13.78	13.73

A period of sixteen hours was allowed for the above saponifications in the cold. It will be noted that practically the same result was obtained by both methods.—Journ. A. Ph. A., March, 1913, 301–302.

**Fixed Oils.**—*Their Polenske and Reichert Values.*—G. D. Elsdon and Herbert Hawley presented a paper at the 1913 Brit. Pharm. Conference on the Polenske and Reichert values of fixed oils. They observe that no Polenske figures are available except for a few edible oils, while Reichert figures have not been published for many samples. The latter constant is included here, as the test is nearly completed in the Polenske determination. The oils in Table I were quite normal, having low acid values. Table II contains the results obtained from the examination of a few old samples of oil. The determinations in many cases were done in duplicate. The figures in Table I are, on the whole, much as might have been expected. The Polenske values for different samples of the same oil do not differ by more than 0.1. The Reichert values are more variable, and for this reason the range is given of the Reichert values for different samples of the same oil. The figures for linseed oil are interesting and make that oil most suitable for use in a blank check on the chemicals used in the Reichert process. The values of the Reichert figures for the old oils in Table II are remarkable, especially as the Polenske value

has only risen slightly. It is quite evident that soluble volatile acids have been formed.

TABLE I.

Oil.	No. of Samples.	Reichert.	Polenske.
Apricot kernel.....	2	0.3	0.3
Colza.....	6	0.1-0.5	0.3
Castor.....	5	0.2-2.3	0.2
Linseed.....	10	0.0	0.1
Soy.....	4	0.1-0.4	0.3
Almond.....	2	0.5	0.2
Cottonseed.....	10	0.2-0.1	0.4
Sesame.....	4	0.1-0.4	0.4
Cod-liver (Newfoundland).....	4	0.1-0.2	0.6
Olive.....	17	0.2-0.8	...
Arachis.....	2	0.4-0.5	...
Croton.....	1	12.7	1.2
Various fish oils.....	20	0.1-0.8	0.2-0.7

TABLE II.

Oil.	Acidity, % KOH.	Reichert.	Polenske.
Cottonseed.....	4.04	11.1	0.6
Menhaden.....	5.04	11.0	0.9
Cod-liver.....	1.02	4.6	0.6
Brusmer.....	2.63	8.2	0.6

—Trans. Brit. Pharm. Conf. (Yearbook of Pharmacy), 1913, 573-575.

**Acetyl Value of Oils.** *Convenient Method of Determination.*—It is well known that in the analysis of castor oil the most valuable indication of purity lies in the determination of the acetyl value. The usual method is tedious and takes up a good deal of time, and it is with the object of shortening the process that this note is communicated by T. Tusting Cocking.

"If the saponification values of the original oil and of the oil after acetylation be determined in the usual manner, the acetyl value can then be calculated from the following formula:

$$\text{Acetyl value} = \frac{(b-a) 1336.5}{1336.5-a}$$

where  $a$  = saponification value of original oil,  
and  $b$  = " " " " acetylated oil.

The construction of the formula is as follows: Suppose 1 Gm. of the oil be acetylated, it will gain in weight due to the acetic acid added, and at the same time there will be a loss due to elimination of water. The total gain will therefore be  $\text{CH}_3\text{COOH}$  minus

$H_2O = C_2H_2O$  : let this be represented by  $x$ . One Gm. of oil has now become  $(1 + x)$  Gm. acetylated oil. The number of milligrams of potassium hydroxide required to saponify this is therefore  $(1 + x) b$ . This is also equal to the milligrams of potassium hydroxide required by the component parts of the acetylated oil." Examples are given, and in a tabulation the figures showing the values found by actual titration of the acetic acid, compared with those calculated from the above formula.—Chem. and Drugg., July 19, 1913, 87.

**Fixed Oil of Almonds vs. Oil of Peach Kernels.**—*Commercial Considerations.*—Dr. F. Neudeck observes that, owing to the high price of almond oil and the comparative cheapness of peach-kernel oil, German wholesalers now list the two oils as almond oil (*Oleum Amygdalarum dulce*, G. P.) obtained from "almonds," and as almond oil (second quality) obtained from "peach kernels." For medicinal purposes, particularly internally, the true oil of almonds alone should be employed; but for this the demand is insignificant when compared with that for a variety of technical purposes, such as polishing of furniture, application to fine leather goods, etc., and for these uses the oil of peach kernels answers quite as well as the true oil of almonds. The author discusses the difficulties that present themselves when the latter oil is supplied as almond oil, the seller coming in conflict with the legal authorities while, on the other hand, if he supplies the oil as peach-kernel oil it is difficult to convince his customer that the price is practically the only distinction between the true kinds of oil for the required use. He suggests that both kinds of oil be admitted into the pharmacopœia under their proper designations, but that for technical use the peach-kernel oil may be supplied as almond oil, or "almond oil from peach kernels."—Pharm. Ztg., lviii (1913), No. 48, 472.

**Linseed Oil.**—*Differentiation from Substitutes.* The occurrence of numerous substitutes for linseed oil varnish on the market leads Gehe & Co. to call attention to various methods for their identification. The most important physical conditions for identification are the indices of refraction and saponification. The qualitative determination of mineral oil is best accomplished by the reaction of Schulz-Kollin: 0.1 Gm. picric acid is dissolved in 10 Cc. benzol and mixed with the varnish. If red coloration results, mineral oil is present. Rosin and train oil are determined by Lippert's method: 3 drops of the varnish are dissolved in



acetic acid and a sub-stratum of sulphuric acid of sp. gr. 1.53 is carefully introduced into the test-tube containing the acetic solution. A brown zone results at the point of contact of the two strata if the linseed oil is pure, while in the presence of resins, rosin oil, or train oil, a red to blue color is developed. The quantitative determination of rosin is best effected by Twitchel's method. —Pharm. Ztg., lviii (1913), No. 33, 328; from Gehe & Co.'s Handelsbericht, 1913.

**Olive Oil.**—*Detection of Ground-Nut Oil.*—Dr. J. Kallier finds that for the detection of ground-nut oil in olive oil it is not sufficient to determine the constants (spec. grav., refraction, and iodine number), but it is imperatively necessary to determine the presence of appreciable quantities of arachidic acid. For this purpose the well-known method for the quantitative determination of arachidic acid is available; but a far better method for the qualitative test is the method of Bellier prescribed in the French Pharmacopœia for the examination of olive oil. —Pharm. Ztg., lviii (1913); No. 42, 416; from Ztschr. f. öffent. Chem., 1913, No. 2.

**Tallow.**—*Detection in Lard.*—Dr. Böhmer has devised and describes a new method for the detection of tallow in lard, which depends on the distinctions of the stearides isolated from the respective fats:  $\beta$ -palmitodistearin (tallow) and  $\alpha$ -palmitodistearin (lard) and the corresponding free acids obtained from them. The necessary tests require 50.0 Gm. of the fat under examination. —Pharm. Ztg., lviii (1913), No. 52, 512.

**Wool-Fat.**—*Detection of Petrolatum.*—G. Tellera recommends the following method: 1 Gm. of the substance is dissolved in 15 Cc. of warm ether. Upon cooling, the stearin separates, the liquid is filtered and 5 Cc. of absolute alcohol are added. If the wool-fat contains 3 to 4 per cent. petrolatum, a flaky precipitate will form at once. If 1 to 2 per cent. of petrolatum is present, then the precipitate will form after a half hour. Solutions of pure wool-fat will remain perfectly clear, but solutions of crude wool-fat will become turbid, owing to their stearin content. —Chem. Zentr. Bl., 1913, 818. (O. R.)

#### CARBOHYDRATES.

**Wood Substance.**—*Decay Due to the Action of Fungi.*—In an interesting lecture on the causes that influence the natural decay of wood, Dr. Lingelsheim attributes this to the action of certain fungi, with particular consideration of the so called "dry rot

fungus" (*Merutius lacrymans*, Germ. "Hausschwamm"). He says that the "wood-destroying fungi" belong to the *Ascomycetes* and the *Basidiomycetes*, while the third large class of fungi, the *Phycomycetes*, contains no wood-destroying fungi, and this is also true of the "Fungi imperfecti;" although certain parasitic fungi belonging to the last-named class also possess the property of rotting wood. The details of this instructive paper must be consulted in the original. Pharm. Ztg., lviii (1913), No. 24, 239.

**Raw Fibers and Cellulose.**—*Estimation.*—In working on the fibrous tissue of cinchona, H. Matthes and F. Koenig have given careful study to the various methods of cellulose estimations. They do not find the Henneberg-Weende method or the method of J. Koenig satisfactory, but do highly recommend the chlorination method of Cross and Bevan. (Congress of Applied Chemistry, 1909.) The paper contains data of 37 experiments—mostly in triplicate—comparing the three methods and their modifications and all either on the same sample of cinchona or on the same batch of filter paper. For these details the original paper must be consulted.—Arch. d. Pharm., 251 (1913), Nos. 3 and 4, 223 and 241. (H. V. A.)

**Soluble Starch.**—*Preparation.*—A. Fernbach proposes the following method for the preparation of a soluble starch: The starch paste containing one to two per cent. of potato starch is poured slowly, under constant stirring, into an excess of acetone. The precipitate is dried in a vacuum, and forms a bulky white powder which is soluble in hot as well as in cold water.—Compt. rend., 155, 617. (O. R.)

**Starch.**—*Injuries Produced by It.*—Abt reviews the "Mehlnährschaden" of the Germans (or the starch injuries) which have been extensively discussed in the German literature and points out that, while this condition seems to be little known in this country, it is, nevertheless, one of considerable importance because the dangers resulting from starch injuries are most frequent in young infants. Starch can be digested by young babies, but only in small quantity. The mortality in these cases is high. J. Am. M. Assoc., 1913, v. 61, 1275–1277. (M. I. W.)

**Dextrin.**—*Production for Industrial Purposes.*—According to Parow, dextrin, which is produced from the starch of potatoes, corn, cassava, and wheat, occurs in commerce in three forms: a powder preserving the structure of the starch grains, a granular

amorphous form, and a thick, milky liquid. The powdered form is obtained by heating starch meal alone or with 0.1 to 0.5 per cent. of acid. In manufacturing liquid dextrins and "crystal gum" some producers use roasted dextrin instead of boiling the starch with dilute acids, as the dry heating of starch gives less sugar than boiling with acids. When dry starch is roasted without the addition of acids temperatures of  $100^{\circ}$  to  $250^{\circ}$  C. are employed, depending upon whether the product is to be white or yellowish. The preparation of starch consists in mixing with 0.25 to 0.20 per cent. of hydrochloric or nitric acid, and subsequent drying and pulverization. The acid, diluted with water, may be introduced into a drum in which the starch is kept well agitated. After breaking up any lumps the product is stored for about one day to permit of thorough impregnation of the acid, and then well dried, ground, sifted, and fed to the roasting apparatus. Various modifications of the method are in use. "Crystal gum," or "arabin," is made by dissolving slightly darkened dextrin, obtained by roasting, in hot water, decolorizing with animal charcoal, filtering, evaporating to dryness, and grinding. Commercial dextrin generally contains 10 to 12 per cent. of moisture, 5 per cent. of dextrose, and 0.2 per cent. of ash; it possesses an acidity corresponding to 3 Cc. of N/1 sodium hydroxide per 100 Gm.—Pharm. Journ. and Pharmacist, Feb. 15, 1914, 211; from Zeit. f. Spiritus-ind., 35, 507, through Journ. Ind. and Eng. Chem., Jan., 1913, 77.

**New Cyclic Sugar.**—*A Product of the Destructive Distillation of Wood.*—According to J. Meyerfeld, a new cyclic sugar, the monose  $C_3H_4O$  or  $C_6H_8O_2$ , "methyleyclopentenolene," has been isolated from pyroligneous acid obtained from the destructive distillation of beechwood. It is of interest as being the first unsaturated ketonic alcohol of the pentamethylene series to be isolated. It occurs in colorless, fragrant, somewhat acid-tasting crystals, melting at  $106^{\circ}$  C., sublimable and boiling at  $210^{\circ}$  C. Readily soluble in hot water, and in most organic solvents, excepting ether and petroleum ether, and cold water. It has a faint acid reaction towards litmus. With ferric chloride it gives a violet color, changing to dark red on adding sodium acetate. It readily forms an osazone with phenylhydrazine. It reduces Fehling's reagent and ammoniacal silver reagent, and forms iodoform in presence of iodine and alkali. Pharm. Journ. and Pharmacist, May 31, 1913, 769; from Chem. Ztg., 36 (1913), 549.

**Cane Sugar.** *Its Detection in Honey.* Charles LaWall, Ph.M.,

concludes a paper on this subject as follows: "It is not possible to detect cane sugar in honey in the sense of a qualitative test; that, as cane sugar is normally present in small amounts, its qualitative determination, preferably by means of the polariscope, becomes necessary; that the form in which sugar is added usually is that of invert sugar which can be readily detected in honey which has never been subjected to heat."—Proc. Penn. Phar. Assn., 1913, 306-307. (E. C. M.)

**Milk-Sugar.**—*Historical Note.*—In connection with the succeeding, the following note by "Xrayser II" is interesting. He says: "Sugar of milk has a history extending over nearly three centuries, and for a considerable part of that time its production has been a well-established industry in Switzerland. It was first separated from whey by an Italian chemist, Fabrizio Bartoletti, in 1619, and was by him called *nitrum seri lactis*, sugar being then and till long afterwards classed among salts. The name by which it is now known is said to have been given to it by another Italian, Testi (by whom is supposedly meant Fulvio Testi), born at Ferrara in 1597, the son of a pharmacist, and himself both a pharmacist and poet, a somewhat rare combination of professions. Nicholson, writing in 1790, speaks of it as being at that time 'separated by evaporation in the large way, for pharmaceutical purposes, in various parts of Switzerland,' and the process he describes differs from that given by Thorpe as still followed there only (excepting some small details) in the use of the whites of eggs, and not alum, in clarifying the aqueous solution of the crude sugar. Nicholson does not say for what particular pharmaceutical purposes it was used, or in what countries, but it never found a place in the London or Edinburgh Pharmacopœias, though it appeared in all foreign ones before its inclusion in the B. P."—Chem. and Drugg., March 8, 1913, 371.

**Milk-Sugar.**—*Manufacture in Germany and in Sweden.*—Mr. J. Pedersen gives full details regarding the manufacture of milk-sugar from personal observations in Germany and Sweden, and as very little has been written on this subject he gives a summary of the modern highly specialized methods:

**German System.**—The whey is treated as soon as possible with milk of lime, from 50 to 100 Gm. of lime being added to each 20 gals. of whey, according to the degree of acidity. The neutralized whey is condensed down about 60 per cent. in a vacuum pan, or until a specific gravity of 30° to 32° Baumé is attained. Con-



densation beyond this results in the whey syrup becoming "very smeary or greasy," and in a lessened yield of milk-sugar. The thick syrup is run into shallow vats, and occasionally stirred during the first ten hours. In about two and a quarter hours' time the temperature should be about  $68^{\circ}$  F. It now appears like a yellow-grained pulp or a supernatant oily layer. To separate the crystals, the sticky mass is mixed with cold water and centrifuged in a separator with fast-revolving drums lined with a filter-cloth or metal sieve. The lactose crystals are left in the washer-screen, and they are washed while the drum is still revolving. Two-thirds of the milk-sugar is extracted in this way, the remainder being left in the syrup. The latter is heated to boiling point, the coagulated albumen skimmed off, and again concentrated *in vacuo* to  $35^{\circ}$  Baumé. After cooling, the lactose is separated from the greasy, brown mass and well washed, from 0.3 to 0.7 per cent. being recovered. In practice about 4 per cent. of raw milk-sugar is obtained from the whey. To remove albumen, traces of fat, etc., the raw product is decolorized and recrystallized. The crude lactose is dissolved in water at  $112^{\circ}$  F. to make a syrup containing 24 to 27 per cent. of milk-sugar (equal to  $15^{\circ}$  Baumé). The solution is then heated to boiling point after the addition of 1 per cent. of powdered charcoal and 0.2 per cent. of acetic acid. While nearly boiling some makers add some magnesium sulphate and keep the solution boiling for a few minutes, but this causes considerable foaming. While still hot the liquid is passed through a filter-press, and the clear syrup concentrated *in vacuo* to  $35^{\circ}$  Baumé, crystallized, and the milk-sugar separated, washed, and dried. The last operation is conducted in rotary inclined cylinders through which a current of hot air passes, or in vacuum dryers, on the shelves of which the moist lactose is placed in thin layers. After cooling, the dried sugar is finely ground in a pebble-mill, and packed in cases containing 100 lbs. to 200 lbs. The percentage of refined sugar obtained from whey is 2.5 to 2.6 per cent.

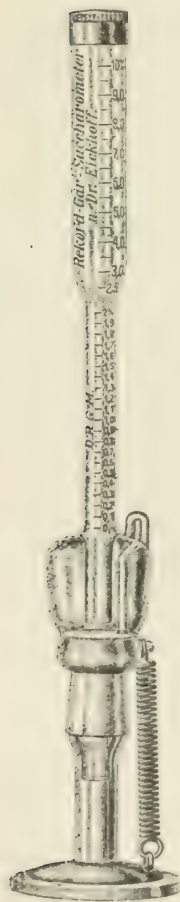
**The Swedish System** consists in scalding fresh whey as soon as possible, skimming off albumen and fat, and condensing to one-third of the original volume in an open cheese-pan. It is further concentrated *in vacuo* at  $143^{\circ}$  F. to a suitable consistency, and the product run into large enamelled pans with slow rotary stirrers. It cools within forty-eight hours to  $78^{\circ}$  F. Crystallizing and refining follows the German method outlined above, with the exception that some alum is added to the decolorized solution of

milk-sugar before filtration. Chem. and Drugg., March 1, 1913, 341.

**Grape Sugar.** *Qualitative and Quantitative Determination in Urine.* According to the experience of W. Beckers the qualitative determination of glucose in urine should be made by the osazone reaction or by Rubner's test, both of which are reliable. To this may be added, if desirable, the determination of the melting point of the osazone, whereby the identity of the sugar is established. The melting point of the glucosazone and of the levulosazone is near  $205^{\circ}$ , that of the lactosazone near  $200^{\circ}$ , and of the pentosazone between  $150^{\circ}$  and  $160^{\circ}$  C. For the quanti-

tative estimation of the sugar polarization is the most reliable. The two methods afford the most reliable means for these determinations of sugar in urine.—Pharm. Ztg., lviii (1913), No. 49, 483; from Berl. klin. Wschr., 1913, No. 19.

FIG. 61.



Fermentation  
Saccharometer

**Fermentation Saccharometer.**—*A New Form.*—

Dr. Eickhoff has devised a new form of fermentation saccharometer, which is supplied by Petrie, Meyer and Holland, Ilmenau, in Thuringia. As shown by Fig. 61, it is constructed in two parts, hermetically fitted together by carefully ground and greased conical surfaces and securely held in place by means of a non-corrosive spiral spring. The lower part, representing the foot of the apparatus, constitutes the fermentation chamber, into which 0.5 Cc. of the undiluted urine is introduced together with a little yeast. The upper part consists of a cylinder, filled with mercury, from which a manometer tube extends, graduated from  $0^{\circ}$  upwards, and reaches to near the bottom of the cylinder. Communication is established between the two parts by means of a small glass tube passing through the mercury chamber and ending in a short bend above the mercury. As fermentation progresses the carbonic acid generated forces the mercury into the manometer in which it rises until the fermentation is ended, whereupon the percentage of sugar contained in the sample may be read on the scale. It is necessary before each opera-

tion to adjust the mercury to  $0^{\circ}$  on the scale, for which convenient provision is made.—*Pharm. Ztg.*, lviii (1913), No. 50, 491.

**Glucose.**—*Estimation in the Blood.*—Rapsis recommends a modified type of the Schenck process which has the advantage of removing all the albumin and also of saving sedimentation. The fresh drawn blood (15–20 Cc.) is introduced into a graduated 250 Cc. flask containing 75 Cc. saturated mercuric chloride solution and 75 Cc. 15% sodium chloride solution. The exact amount of blood introduced is then learned by filling the flask with practically equal amounts of bichloride and of the salt solutions run in from burettes. To the mixture is added 0.5 Cc. 31% HCl, and after shaking, it is filtered and an amount of the filtrate representing 10 Cc. blood is treated with  $H_2S$  (to remove the mercury), the filtrate evaporated, neutralized with sodium bicarbonate and the residue in evaporating dish washed with enough water to make 100 Cc. of solution. This solution is placed in a burette and its sugar content estimated by the usual procedure with Fehling's solution.—*Schweiz. Wschr. f. Chem. u. Pharm.*, 51 (1913), No. 1, 2. (H. V. A.)

**Alpha-Glucosidase.**—*Reversibility of Fermentative Action by Its Influence.*—It has been previously shown that the specific ferment of bottom yeast,  $\alpha$ -glucosidase, has a synthetizing action, forming alcohol  $\alpha$ -glucosides in a manner precisely analogous to the formation of  $\beta$ -glucosides by emulsin. E. Bourquelot and E. Verdon have now found, however, that the analogy goes further, and that the hydrolyzing power of  $\alpha$ -glucosidase is exactly equivalent to its synthetizing power, and is reversible under given conditions. *Pharm. Journ. and Pharmacist*, July 26, 1913, 113; from *Compt. rend.*, 156 (1913), 1938.

**Beta-Methyl and Beta-Allyl Galactosides.**—*Synthesis by the Biochemical Method.*—E. Bourquelot and M. Bridel report that by the action of emulsin on a solution of galactose in methyl alcohol 85 per cent. by weight at the ordinary temperature  $\beta$ -methyl galactoside has been obtained in long, faintly sweetish needles, melting at  $178^{\circ}C$ . They are soluble in water and in alcohol; insoluble in acetic ether. The solutions are optically inactive, and do not reduce Fehling's reagent. The aqueous solution is slowly hydrolyzed by emulsin. This galactoside has been previously obtained by Fischer by chemical methods.  $\beta$ -Allyl galactoside, obtained by the authors in an analogous manner with allyl

alcohol, is quite new. It forms fine, tufted needles with a slightly bitter taste. Its aqueous solution has the opt. rot.  $-12^{\circ} 5'$ . It does not reduce Fehling's reagent, and is slowly hydrolyzed by emulsin, giving off the characteristic odor of allyl alcohol.—Pharm. Journ. and Pharmacist, May 3, 1913, 629; from Compt. rend., 156 (1913), 1104.

**Quebrachit.**—Em. Bourquelot and A. Fichtenholz discovered in the leaves of *Grevillea robusta*, a lævo-rotatory inosite which is identical with quebrachit, prepared from the bark of *Aspidosperma quebracho*. The yield of the leaves is 4 per mille, while that of the bark of quebracho is only 1 per mille.—Journ. de Pharm. et. Chim., 1912, 346. (O. R.)

#### ORGANIC ACIDS.

**Organic Acids.** *Preparation of Ammonium Salts.*—E. II. Keisein and L. MacMaster observe that the usual method of neutralizing an aqueous solution of an organic acid in ammonia and evaporating to crystallization, is unsatisfactory, owing to the hydrolytic action of water upon these salts. The method suggested depends upon the fact that most organic acids are soluble in ether or alcohol, or a mixture of the two, while the ammonium salts are insoluble, and can be thrown down by a stream of dry ammonia gas. When the ethereal solution of the acid is treated with the stream of ammonia gas, crystalline with amorphous precipitates are thrown down at once; and then are washed with ether and dried. In some cases a gelatinous precipitate is first formed, but this soon changes into a crystalline powder. Ammonium malate, formate, misaconate, and citraconate have been satisfactorily made in this way.—Chem. News, March 14, 1913, 122.

**Diluted Acetic Acid, G. P.**—*Incorrect Specific Gravity.*—Wiebelitz has observed on different occasions that diluted acetic acid, G. P., received direct from the manufacturer, had a slightly higher specific gravity than that described for the official acid containing 30 per cent. of absolute acid, namely: sp. gr. 1.042 1.0425 instead of 1.041 at  $15^{\circ}$ . Titration of a dilute acid having the specific gravity 1.042 at  $15^{\circ}$ , however, gave a percentage of 30.1 per cent. On the other hand, a diluted acid, which had been proven free from sulphurous, formic, and other contaminant acids, after accurate adjustment to a specific gravity of 1.041 at  $15^{\circ}$ , was found on titration to contain only 29.4 per cent. of absolute acetic acid. The official statement of the specific gravity of *Acidum aceticum*



*dilutum*, G. P., therefore, does not correspond with the requirement of a 30 per cent. content of absolute acid. Pharm. Ztg., lviii (1913), No. 56, 552.

**Diluted Acetic Acid, G. P.** Referring to the above observations of Wiebelitz, K. Eng mentions that his own observations coincide with those of Wiebelitz in essentials. Inasmuch, however, as the Pharmacopœia ignores the presence of insignificant quantities of formic acid, which is excluded by the permanganate test, he believes that the divergence in the pharmacopœial statement of specific gravity and acid percentage is in part ascribable to the presence of formic acid; possibly also to the presence of a little carbonic acid in the sodium hydroxide solution used for the titration.—*Ibid.*, No. 60, 591.

**Trichloroacetic Acid.**—*Decomposition by Mercuric Oxide.* K. Brand finds that when a yellow or red mercuric oxide is added to a moderately concentrated solution of trichloroacetic acid in water, the oxide is dissolved without any other noteworthy effect. If then the solution is heated to boiling, a sudden evolution of gas occurs, which is often so violent as to cause the contents of the vessel to froth over, and a white crystalline precipitate of mercurous chloride is deposited. The gas eliminated by the reaction was composed of carbon monoxide, carbon dioxide, and chloroform.—Pharm. Ztg., lviii (1913), No. 84, 839; from Journ. f. prakt. Chem., 88 (1913), Nos. 7 and 8.

**Crude Pyroligneous Acid.**—*Modification of the G. P. Requirement.*—The G. P. requires that 10 Cc. of crude wood vinegar should not react alkaline on litmus paper after the addition of 10 Cc. of normal potassium hydroxide, which indicates a content of at least 6 per cent. of acetic acid. G. Frerichs finds that this requirement no longer suffices; modern methods of manufacture offer an inducement to substitute inferior products, from which acetic acid has been partially extracted and replaced by other acids. He therefore suggests the following modification of the official requirement: "100.0 crude wood vinegar must yield at least 80 per cent. of clear, nearly colorless distillate. 10 Cc. of this distillate must neutralize at least 10 Cc. of normal potassium hydroxide solution, indicating 6 per cent. acetic acid in the distillate." The directions for preparing

**Purified Wood Vinegar** must be correspondingly modified. The distillate must be adjusted by the addition of water, if necessary,

to 6 per cent., and the determination of percentage must not be made by titration, but by distillation, since the author has found by experiment that rectified wood vinegar prepared by himself contained a much lower percentage of acid than was expected.—Apoth. Ztg., xxviii (1913), No. 56, 525-526.

**Benzoic Acid.**—*Substitution of Synthetic for Natural Acid.*—Fred. Bodinus directs attention to the substitution of synthetic benzoic acid (from toluol or benzotrichloride) for natural benzoic acid from Siam benzoin. The parcel, having the label "Acid. benz. e Siam verum" (of a renowned firm), consisted of small, snow-white, silky needles, having only a very faint odor, and giving indubitable evidence of being a synthetic product by a strong reaction for chlorine and by failing to reduce potassium permanganate when the official tests of the G. P. were applied. Incidentally, the author criticizes the G. P. V test for chlorine as being unnecessarily tedious, and suggests that it be replaced by the following simple requirement: "*Acidum benzoicum*, introduced into a luminous flame on copper wire, must not assume a green color." The test is carried out by moistening the previously ignited copper wire with distilled water, attaching a few crystals of the acid, and inserting it into the flame from above. Benzoic acid obtained by the author from Siam benzoin by sublimation failed to give the slightest trace of green coloration to the flame. Furthermore, the time required for the decoloration of permanganate should be reduced to 15 or 20 minutes, 4 hours being unnecessarily moderate and time-consuming. Finally, the author expresses the opinion that the pharmacopœial tests, however rigidly observed and carried out, are futile when it comes to the discovery of skillful falsifications, and the only safeguard therefore consists in the pharmacists' own preparation from material of reliable origin. Pharm. Ztg., lviii (1913), No. 27, 266.

**Benzoic Acid.** *Modification of Jonescu's Test.*—Jonescu's test is based on the conversion of benzoic acid into salicylic acid by hydrogen peroxide. P. Fleury observes that all the methods in use for carrying out this test employ heat, but it is shown that heat is liable to carry the reaction too far, and thus to cause failure. While the reaction takes place in cold, some hours are required for the purpose, but the addition of a trace of ferrous sulphate, which acts as a catalyzer, ensures complete reaction in a fraction of a minute. The technique recommended is as follows:—Ten Cc. of the solution to be tested (containing 1 to 5 Mgm. of free

benzoic acid) are treated with three drops of solution of ferric chloride (sp. gr. 1.260, containing about 26 per cent. of anhydrous salt) diluted 1 to 10, then with three drops of solution of hydrogen peroxide (12 vol.), also diluted 1 to 10, and finally with three drops of 3 per cent. solution of ferrous sulphate. The reagents are added in the order given, shaking after each addition. In about thirty seconds the reaction commences, and the violet coloration attains its maximum in five to ten minutes. The reaction is sensitive to two-tenths of a milligram of benzoic acid. — Pharm. Journ. and Pharmacist, November 29, 1913, 809; from Journ. de Pharm. et Chim., November 16, 1913, 460.

**Benzoic and Myristic Acids.** — *Formation of Glyceryl Esters.* — A. Lipp and P. Miller find that by heating glycerin in sealed tubes with one, two, or three molecular weights of benzoic acid, the respective mono-, di-, and triglyceryl benzoates are obtained. The first,  $C_6H_5(OH)_2COOC_6H_5$ , is a colorless, thick, oily liquid, miscible in all proportions with hot water, but not readily soluble in cold water. The second,  $C_6H_5(OH)(COOC_6H_5)_2$ , is a thick liquid which cannot be distilled without decomposition. The third,  $C_6H_5(COOC_6H_5)_3$ , crystallizes in long, silky needles. By heating myristic acid and glycerin in equimolecular proportions, in a sealed tube, the main product is monomyristicin,  $C_3H_5(OH)_2C_{14}H_{27}O_2$ , melting at  $68^\circ$ . Simultaneously, however, dimyristicin,  $C_3H_5(OH)(C_{14}H_{27}O_2)_2$ , and trimyristicin,  $C_3H_5(C_{14}H_{27}O_2)_3$ , are formed. These three myristicins are easily separated: the first is very sparingly soluble in cold petroleum ether, the second is much more soluble in alcohol than the third. — Apoth. Ztg., xxviii (1913), 791; from Journ. f. prakt. Chem., 88 (1913), 361.

**Benzoates and Salicylates.** — *Modified Method of Their Assay.* — Joseph W. Ehman describes six methods which have been recommended and employed for the assay of benzoates and salicylates and mentions certain faults which are satisfactorily obviated by the following modification:

To 0.200 to 0.500 Gm. of the salt, placed in a separator and dissolved in 20 to 30 Cc. of water, add 2 to 4 Cc. N/1  $H_2SO_4$  (or HCl) (note); a mixture of ether 1 vol. and chloroform 2 vols. is used for extraction, of which three portions of 15–20 Cc. each are usually sufficient for complete extraction; to the mixed ether-chloroform extractions in a flask, add a little water (10 Cc.) and titrate with N/10 NaOH V. S., phenolphthalein indicator; or, the first portion separated may be titrated, then the second added, titration con-

tinued and so on until no more alkali V. S. is required to give a permanent pink color to the aqueous layer after thorough agitation.

The following results were obtained:

Sodium Salicylate.	Ammonium Salicylate.	Strontium Salicylate.	Sodium Benzoate.	Lithium Benzoate.
98.088%	98.28%	98.38%	99.063%	99.059%
99.32%	98.147%	98.38%	97.41%	....
99.72%	....	....	....	....
100.039%	....	....	....	....
100.12%	....	....	....	....
98.82%	....	....	....	....

—Journ. A. Ph. A., February, 1913, 156–157.

**Zinc Benzoate.** —*Examination for Sulphate as Contaminant.*—

Having found a parcel of zinc benzoate contaminated with sulphate, doubtless the result of insufficient washing, A. Linton Davidson attempted to estimate the zinc oxide by ignition in a small muffle, but it was found that the large quantity of carbon present tended to reduce the zinc to the metallic state, and, consequently, low figures were obtained. At the same time an attempt was made to determine the proportion of acid radicle by dissolving the salt in boiling dilute acid, cooling, and extracting with ether; then distilling off the ether, drying and weighing the residue; again, low results were obtained owing to the volatility of benzoic acid in small quantities of water. After several futile attempts, the following methods of estimation were adopted:

Three Gm. of the substance were dissolved in 100 Cc. of boiling water, containing 5 Cc. of hydrochloric acid, using a reflux condenser to prevent undue volatilization of the acid. After cooling the solution, the benzoic acid was extracted with ether, which was washed and set aside. The aqueous portion was diluted to 250 Cc., and 100 Cc. were titrated with semi-normal potassium ferrocyanide, previously standardized against pure zinc sulphate, using uranium nitrate as external indicator, the end point being taken when one drop of the zinc solution allowed to fall from a glass rod on to a drop of uranium nitrate produced a brown stain immediately. The ethereal solution was now shaken up with 30 Cc. normal sodium hydroxide, and washed. The mixed aqueous portion and washings were titrated with normal sulphuric acid, using phenolphthalein as indicator; from this the percentage of benzoic acid may be readily calculated. This solution was boiled and acidified, and on cooling the benzoic acid crystallized out; this was washed and dried, and used for melting-point determinations.



The sulphates where present were determined by decomposing 5 Gm. with dilute boiling hydrochloric acid, cooling and filtering off the benzoic acid; the sulphate was precipitated as barium sulphate with barium chloride in the usual manner. *Pharm. Journ. and Pharmacist*, November 8, 1913, 686.

**Formic Acid.**—*Catalytic Decomposition.*—According to A. Maihle, formic acid is decomposed in three different ways by different catalysts: (a) Platinum or palladium black, reduced copper, nickel or cadmium, zinc oxide and stannic oxide all cause decomposition, at appropriate temperatures, into carbon dioxide and hydrogen, thus:  $\text{HCO}_2\text{H} = \text{CO}_2 + \text{H}_2$ . (b) Oxides of zirconium, titanium, aluminium, silicon, tungsten and uranium bring about dehydration in the same way as sulphuric acid or oxalic acid, according to the equation:  $\text{HCO}_2\text{H} = \text{CO} + \text{H}_2\text{O}$ . (c) Calcium oxide causes the formation of formic aldehyde, thus:  $2\text{HCO}_2\text{H} = \text{HCHO} + \text{CO}_2 + \text{H}_2\text{O}$ . This reaction is also brought about to some extent by the second class of catalysts. "Mixed catalysts," such as thorium oxide, ferrous oxide, magnesium oxide, etc., bring about all three reactions simultaneously and also at certain temperatures a secondary reaction, resulting in the formation of methyl alcohol, thus:  $\text{HCO}_2\text{H} + \text{HCHO} = \text{CO}_2 + \text{CH}_3\text{OH}$ .—*Chem. Ztg.*, 80 (1913), 806.

**Formates.**—*Composition of Some Commercial Salts.*—C. H. Hampshire and W. R. Pratt, introducing a comprehensive chemical investigation of a number of commercial formates in a paper read before the British Pharmaceutical Conference, 1913, observe that since the introduction of formates into medicine the attention of pharmacists and manufacturers has been directed to the chemistry of these salts, with the result that many points of theoretical and practical value have been settled. The formulas given in the "B. P. Codex," however, have been challenged on more than one occasion, and the authors have therefore considered it desirable to undertake an examination of commercial specimens of the principal formates, and an investigation on the methods of preparation, the results of which may be given in brevity as follows:

**Sodium Formate** as found in commerce varies considerably; some samples are practically anhydrous and others approximate more or less closely to the composition of a dehydrate,  $\text{HCOO} \cdot \text{Na} \cdot 2\text{H}_2\text{O}$ . The *anhydrous salt*,  $\text{HCOONa}$ , should be used in pharmacy on account of its greater constancy and superior keeping properties. It is obtained as a granular powder by evaporating

a solution nearly to dryness on the steam bath and drying the product at  $130^{\circ}$ . The *dihydrate* was obtained by crystallizing at temperatures between  $25^{\circ}$  and  $18^{\circ}$ , in the form of long, stout prisms, which when dried by means of a centrifuge had the composition  $\text{HCOONa} \cdot 2\text{H}_2\text{O}$ . This contains 65.4% of the anhydrous salt. The variations in composition of six samples of the commercial salt showed from 62.6% to 99.2% of  $\text{HCOONa}$ .

**Ferric Formate.**—The "B. P. Codex" ascribes to this salt the formula  $\text{Fe}_2(\text{HCO}_2)_6 \cdot \text{H}_2\text{O}$ , and states that it can be prepared by digesting freshly precipitated ferric hydroxide in aqueous formic acid for several days, evaporating the filtered liquid to dryness at  $70^{\circ}$ , and drying the residue at  $40^{\circ} \text{C}$ . The authors find that commercial samples of the formate prepared by this method do not give analytical figures agreeing with the above-mentioned formula, nor could such figures be obtained from salts prepared by several other methods. Belloni (1909) describes a salt prepared by dissolving ferric hydroxide in 50 per cent. formic acid (sp. gr. 1.124) on a water bath, filtering, evaporating down, and cooling. Copper-red needles were deposited, to which he ascribed the formula  $\text{Fe}_3(\text{OH})_2(\text{HCO}_2)_7 \cdot 4\text{H}_2\text{O}$ . This salt was very soluble. This salt cannot be dehydrated *in vacuo* beyond the salt corresponding to a dihydrate without losing formic acid, and it is this salt that is recommended. It can be prepared by several methods which the authors describe. Attempts to prepare a Normal Ferric Formate were unsuccessful, although a less basic body corresponding to  $\text{Fe}_3(\text{OH})(\text{HCO}_2)_8 \cdot 2\text{H}_2\text{O}$  was prepared. Six commercial specimens examined gave figures corresponding to the formula of the salt recommended.

**Magnesium Formate** had the formula  $\text{Mg}(\text{HCO}_2)_2 \cdot 2\text{H}_2\text{O}$ , the five commercial samples agreeing with this composition.

**Calcium Formate** corresponded in composition to the anhydrous salt  $\text{Ca}(\text{HCO}_2)_2$ . Five commercial specimens contained 64.6 to 68.7 per cent.  $\text{HCO}_2$ , compared with the theoretical 69.2 per cent. Two (one containing 1.1 per cent. of calcium oxide and another 1.4 per cent. of calcium chloride) were described as "very impure."

**Quinine Formate.** The basic formate, which is always used, is the monohydrate  $\text{C}_{20}\text{H}_{21}\text{N}_3\text{O}_2 \cdot \text{HCO}_2\text{H} \cdot \text{H}_2\text{O}$ . The "B. P. Codex" wrongly gives the formula as anhydrous. Five commercial specimens agreed well with this composition. The salt is stable under

ordinary conditions and very soluble in water. The normal salt is unsuited for pharmaceutical purposes, as it loses formic acid.

**Strychnine Formate.**—It was found practically impossible to prepare and preserve the product  $C_{21}H_{22}N_2O_2 \cdot HCO_2H \cdot 2H_2O$ , containing two molecules of water. As stated by Luman, the anhydrous salt is easily made by drying below  $90^\circ$ . It can also be prepared by drying *in vacuo* for three days. The weight-in-weight solubility in water was: at  $19.5^\circ C.$ , 1 in 3.27; at  $24^\circ C.$ , 1 in 2.52; and at  $27^\circ C.$ , 1 in 2.26. In absolute alcohol one part was soluble in 10 parts by weight at  $18.5^\circ C.$ , and 1 in 9.4 at  $22^\circ C.$  Trans. Brit. Pharm. Conf. (Yearbook of Pharmacy), 1913, 546-560.

**Uranyl Formate.**—*Preparation and Properties.* G. Courtois finds that uranyl formate may be prepared as follows:—100 Gm. of the monohydrated uranium oxide,  $UO_3 \cdot H_2O$ , are placed in a porcelain dish with 700 to 800 Cc. of distilled water and heated on the water bath to about  $80^\circ$ , then 60 to 70 Gm. of formic acid are added, and the whole stirred until complete solution is effected. The solution is concentrated to half its volume and set aside to crystallize. The salt thus obtained is in octahedral yellow crystals, and is a neutral uranyl formate containing 1 molecule of water; it corresponds to the formula  $(HCO_2)_2UO_2 \cdot H_2O$ . Prolonged exposure over sulphuric acid in a desiccator has no action on the salt, whose weight under these conditions remains perfectly constant, nor has phosphoric anhydride any effect. If crystallization is effected at the temperature of melting ice, the same degree of hydration obtains. Exposure to a temperature of  $100^\circ$  to  $110^\circ$  in an oven does not drive off the water of crystallization; at  $150^\circ$ – $160^\circ$ , however, it loses its water after two hours and gradually decomposes with loss of formic acid. It is soluble in water at  $15^\circ$  to the extent of 7.20 per cent., but the saturated solution is not stable, since it dissociates in a few hours into formic acid and a basic salt. It is very little soluble in concentrated formic acid, which precipitates it from its solutions in very fine crystals. In methyl alcohol, its solubility is 4.90 per cent. at  $18^\circ$ ; scarcely soluble in 90 per cent. alcohol, insoluble in ether, carbon disulphide, acetone, benzene, carbon tetrachloride, and petroleum ether. A concentrated aqueous solution when boiled yields an abundant precipitate of yellowish white crystals of a basic formate of the composition:  $(HCO_2)_2UO_2 \cdot H_2O$ ;  $UO_3 \cdot 2H_2O$ ; and this basic formate in its turn, on prolonged boiling, finally yields uranic acid,  $UO_3 \cdot H_2O$ . Pharm. Journ. and Pharmacist, July 26, 1913, 113; from Bull. Soc. chim. de France, May 5, 1913, 449.

**Bismuth Subgallate.** *Adulteration with Sulphur.*—Manseau found bismuth subgallate which contained only 47% instead of 56% of bismuth oxide. The sample was adulterated with 20% of sulphur.—*Répert. Pharm.*, 24 (1912), 447. (O. R.)

**Lactic Acid Ferments.**—W. A. Puckner states that the frequently made assertions that the lactic acid preparations on the market are worthless led to an examination of the available commercial products. This examination showed that while all products containing living bacteria are bound to deteriorate, the preparations examined were in viable condition, though, as was to be expected, liquid cultures were more active than were the tablet preparations. It was also found that manufacturers of these products are making every effort to insure the dispensing of reliable preparations when they are ordered by physicians.—*J. Am. M. Assoc.*, v. 61, 2084. (M. I. W.)

**Aluminium Lacticum.** *A Substitute for the Acetate.*—Dr. A. Perutz recommends a 7 per cent. solution of aluminium lactate as a substitute for solution of aluminium acetate, over which it has the advantage of great stability.—*Münch. Med. Wschr.*, 1913, No. 23.

**Malonic Acid.**—*Separation and Quantitative Determination.*—For the separation of malonic acid from other organic acids, J. Bougault takes advantage of the fact that it forms quantitatively definite condensation products with aromatic aldehydes. This property enables it to be separated from mixtures of oxalic, citric, and other organic acids, and from a number of simple mixtures of salts. The author employs cinnamic aldehyde as the reagent, operating in the presence of excess of acetic acid. The reaction mixture is heated for ten hours in a sealed tube in the boiling water bath. The product is then dissolved in water, and the cinnamylidene malonic acid,  $C_6H_5.CH:CH.CH:C(COOH)_2$ , is liberated by adding hydrochloric acid, as an insoluble yellow precipitate, which is collected, dried at 100° C., and weighed. A correction of 2 Mgm. for every 10 Cc. of mother liquor is made to correct for its slight solubility. The results obtained are concordant, but slightly above the theoretical yield. *Pharm. Journ. and Pharmacist*, November 8, 1913, 687; from *Journ. de Pharm. et Chim.*, 1913, 8, 289.

**Oxalic Acid.** *Assay in Vegetable Products.* A. Grégoire and E. Carpioux, after criticizing adversely some of the processes in



use for the assay of oxalic acid in vegetable products, highly recommend the following method: 5 Gm. of sesame oil cake (for example) either as it is, or previously freed from oil by ether, is digested on a water bath with 20 Cc. of 4 per cent. hydrochloric acid for an hour; a small quantity of dried sodium sulphate is then added to the liquid, to ensure precipitation of calcium, then after cooling, about 100 Cc. of 94 per cent. alcohol is added. After settling it is filtered, and the filter washed with alcohol. This operation eliminates a large proportion of nitrogenized substances. To the filtrate is added a slight excess of ammonia; the alcohol is driven off, the residue taken up with water acidulated with hydrochloric acid, and filtered; the oxalic acid is now precipitated with calcium acetate in slightly acetic solution. After depositing, the liquid is filtered, washed quickly, and the precipitate redissolved by hydrochloric acid; the solution thus obtained is evaporated nearly to dryness, when a few drops of 25 per cent. sulphuric acid is added, along with a quantity of anhydrous sodium sulphate sufficient to produce a dry mass. This is extracted by ether, five or six times; the ethereal solution, rendered slightly ammoniacal, is evaporated, the residue taken up with water, and the oxalic acid precipitated by calcium acetate in slightly acetic solution. The precipitate is calcined, and the calcium oxide obtained weighed. The precipitated calcium oxalate obtained by this process is very pure, and the analytical results show great uniformity.—Pharm. Journ. and Pharmacist, May 10, 1913, 663; from Ann. Chim. Analyt., April 15, 1913, 145.

**Saccharin.**—*Water Content.*—A. Heiduschka and J. Schmid report, upon drying the saccharin, the temperature at 105° to 110° C. as required in the German Saccharin law of July 7th, 1902, that in the case of *soluble* saccharin containing sodium bicarbonate, carbon dioxide is also generated, and lost. Upon heating sodium bicarbonate to 85° C. it commences to decompose, and at 100° to 105° C. it loses 4.227 per cent. of its weight. Ph. Zhalle., 1913, No. 38. (O. R.)

**Salicylic Acid.** *Determination in Fruit Juices.* Investigations undertaken by W. Heintz and R. Limprich to determine salicylic acid in fruit juices have given results which they formulate as follows: The method of Vierhout, consisting in shaking out the salicylic acid with petroleum ether and titrating its quantity in the solution, gives perfectly worthless values. By shaking liquids containing salicylic acid with 2 volumes of petroleum ether and 1

volume of alcohol, as described by Vierhout, it is possible to partially extract the salicylic acid without producing disturbing emulsions, or that bodies interfering with the iron reaction pass into the petroleum ether. From aqueous solutions of varying salicylic acid content, under the same conditions, the corresponding percentage of salicylic acid uniformly passes into the petroleum ether. On shaking a solution of salicylic acid in petroleum ether with a dilute solution of ferric chloride, the salicylic acid passes quantitatively, in form of the well-known violet iron salt, into the aqueous layer. This new method assures the quantitative determination of the salicylic acid with sufficient accuracy. The method is also applicable to the determination of the acid in marmalades, wine and beer.—Pharm. Ztg., lviii (1913), No. 56, 551; from Ztschr. f. Unters. d. Nahr. u. Genussm., 25 (1913), No. 12.

**Salicylic Acid.**—*Solubility in Oils.*—Determinations made by N. O. Engfeld have demonstrated that the solubility of salicylic acid in various oils is increased by the presence of linolic and linolenic radicals with two or three double bonds; the greater the amount of unsaturated fatty acids the smaller the solubility of salicylic acid. The actual solubility of the acid in different oils is shown by the following percentages: Liquid paraffin, 0; Ol. Phocæ, 1.70; Ol. Jecoris Aselli, 1.86; Ol. Arachidis, 1.88; Ol. Amygd., 2.08; Ol. Olivæ, 2.14; Ol. Rapæ, 2.17; Ol. Papav., 2.22; Ol. Sesami, 2.61; Ol. Cannabis, 3.00; Ol. Lini, 3.04; Ol. Juglandis, 3.15; Ol. Gossypii, 3.23; Ol. Ricini, 12.98 per cent. The solubility in other oils may be increased by adding castor oil to them.—Pharm. Journ. and Pharmacist, May 31, 1913, 769; from Farm. Rev., 1913, 8.

**Natural and Synthetic Salicylates.** W. A. Puckner reports for the Council on Pharmacy and Chemistry a series of investigations which showed conclusively that:

1. Contrary to certain statements in the older literature, there is no difference in the toxic dose for animals between "natural" sodium salicylate, the most highly purified synthetic and the cheapest commercial sodium salicylate now found on the market.

2. The evidence for the claimed clinical differences, as found in medical literature, is extremely unsatisfactory and inconclusive.

3. No significant chemical impurities are present in commercial synthetic salicylate.

4. No difference can be detected clinically, either in the thera-

peutic or toxic effects, if the comparison is made under conditions which strictly exclude personal bias.

The Council, therefore, concludes that there is no difference in the actions of "natural" and "synthetic" salicylates, and that statements that differences exist are unfounded. J. Am. M. Assoc., 1913, v. 61, 979. (M. I. W.)

**Natural and Synthetic Salicylates.** *Editorial Comment.* The chemical examination of the products on the market showed no chemical difference between the natural and synthetic salicylates; the pharmacologic examination showed no difference in the action of the products; and analysis and critical survey of the whole literature on the subject showed that from previous studies there is no ground for the conclusions that the natural salicylates are superior in any way to the synthetic and the report of a number of clinicians, including many who had decided opinions on the question, showed that from a clinical point of view the action of salicylates of unknown origin cannot be differentiated. The collective tabulation of the reported results showed that the natural and the synthetic products give almost mathematically the same percentage of therapeutic results in all of the phenomena recorded. J. Am. M. Assoc., 1913, v. 61, 968. (M. I. W.)

**Natural and Synthetic Sodium Salicylate.** *Clinical Effects.*—A. W. Hewlett reports on the clinical effects of natural and synthetic sodium salicylate with table, showing the principal results of reports from 15 collaborators. The general result of the cooperative investigation as to the relative therapeutic value of sodium salicylate derived from natural sources and of sodium salicylate prepared by synthetic methods, showed no essential differences between the two. The slight variations in one direction or the other as shown by the figures are such as one expects in any set of statistics. J. Am. M. Assoc., 1913, v. 61, 319-321. (M. I. W.)

**Salicylates.** *Toxicity.* Hanzlik contributes a study of the toxicity of the salicylates based on clinical statistics. The main toxic doses of the different salicylates for adult males and females, respectively, are 180 and 140 grains of the synthetic sodium salicylate; 200 and 135 grains of the natural sodium salicylate; 120 minims of the oil of gaultheria (methyl salicylate); 165 and 120 grains of acetylsalicylic acid (aspirin); and 100 and 83 grains of salicylosalicylic acid (diplosal). For females the toxic dose of the salicylates is approximately 80 per cent. of that for males. The toxic dose of salicylosalicylic acid is about 50 per cent.; that of methyl salicylate

and acetylsalicylic acid about 60 per cent. of that of sodium salicylate. The toxic dose of the different salicylates is not influenced by age between 16 and 75 years. Individuals show idiosyncrasy toward toxic doses of the synthetic salicylate, but no connection was found between these idiosyncrasies and the factors of age, sex, race and diseased condition. The idiosyncrasy generally varies in the same patient, and is not influenced by previous salicylate medication.—J. Am. M. Assoc., v. 60, 957-962. (M. I. W.)

**Sodium Salicylate.**—*Commercial Purity.*—W. S. Hilpert reports on the purity of commercial sodium salicylate. Investigations indicate that except for some differences in the color of aqueous solutions all the brands of sodium salicylate examined were essentially alike in properties and composition and warrant the conclusion that the cheapest commercial synthetic sodium salicylate is the equal of the higher-priced brands of the synthetic kind or the costly natural product.—J. Am. M. Assoc., v. 60, 1137-1139. (M. I. W.)

**Senecionic Acid.**—*Chemical Identity with b-Dimethylacrylic Acid.*—Twenty years ago Shimoyama described an acid obtained from *Ligularia tussilaginea* which he named senecionic acid and which he found to have the composition  $C_5H_8O_2$ . Asahina has taken up the question as to which of the several isomeric unsaturated acids of that formula it really was, having the opportunity of studying the subject with Shimoyama's original sample. He finds that senecionic acid is really *b*-dimethylacrylic acid.—Arch. d. Pharm., 251 (1913), No. 5, 355. (H. V. A.)

**Strophanthic Acid.**—*Pharmacological Properties.*—E. Hessel reports the results of a pharmacological study of the saponin, *strophanthic acid*, which has been determined as a constituent of the seeds of different species of *Strophanthus* (see *Strophanthus gratus*, under *Materia Medica*). He finds this saponin to possess hæmolytic and strong diuretic properties, and attributes these properties when manifested in *strophanthus* tinctures to its presence, or to its presence as an impurity in *strophanthin*—the latter, when pure, being devoid of diuretic activity. This explains why Catillon has for years recommended galenical preparations of *Strophanthus hispidus* seeds as a powerful diuretic, but *hispidus strophanthin* alone as a cardiac remedy, emphasizing that the latter is entirely devoid of diuretic action. Pharm. Ztg., lviii (1913), No. 49, 484; from Sitzungsber. d. naturforsch. Ges. z. Rostock, N. F., Vol. V.



**Tannin.** *Chemical History.* Feist and Haun publish an important article on the tannin problem beginning with a comprehensive outline of chemical history of this substance and critical review of the modern ideas concerning its structure, showing that the difficulty encountered in arriving at a satisfactory conclusion concerning its composition comes from the fact that all tannins are mixtures of varying composition and that very few of the ingredients of these mixtures are obtained in crystalline form. After citing the views of Fischer and Freudenberg and of Nierenstein on the structure of tannin, the authors report at length on their respective experimental work supplementing that of the previous investigators. The conclusions reached by Feist and Haun are:

1. While free glucogallic acid is extracted from Turkish nutgall by treatment with appropriate solvents the same solvents extract from Chinese nutgall only gallic acid.

2. In addition, both tannins contain definite combinations of glucose with gallic acid, the substance obtained from Chinese tannin containing less glucose than that from Turkish tannin.

3. The glucogallic acid mentioned above is an ester consisting of one molecule of glucose with one molecule of gallic acid.

4. This glucogallic acid is combined in nutgall with other gallic acid molecules and with methylated tannins.

5. On methylating tannin, substances showing various degrees of methylation were obtained, thus adding another proof of the complex character of tannin.

6. In their work, the authors prepared phosphoric acid and arsenic acid combinations of acetylglucose; acetyl combinations of glucogallic acid, as well as the methylated products just mentioned. —Arch. d. Pharm., 251 (1913), Nos. 6 and 7, 468 and 481. (H. V. A.)

#### ORGANIC BASES.

**Alkaloids.** *Administration before Anæsthesia.* Isabella C. Herb reviews some of the claims for the use of sedative drugs in connection with general anæsthetics, calls attention to some of the dangers that are incurred and concludes that the administration of morphine, scopolamine and atropine before general anæsthesia has certain advantages but these advantages are not sufficient to counterbalance the risks attendant on their employment. The loss of the pupillary reflex is a serious handicap and the claim that the danger from ether, chloroform or nitrous oxide is diminished is contrary to the evidence at hand. The employment of alkaloids

has a distinct field of usefulness before local analgesia. —J. Am. M. Assoc., 1913, v. 61, 834-837. (M. I. W.)

**Alkaloids.** *Precipitation by Lloyd's Reagent.*—A paper descriptive of this new and valuable addition to pharmaceutical chemistry is contributed by M. I. Wilbert, Ph.M., who says it promises to have a far-reaching influence in the future development of pharmacy. By means of this reagent bitter alkaloids are made absolutely tasteless, while losing none of their remedial power. —Proc. Penn. Phar. Assn., 1913, 274-5. (E. C. M.)

**Acetanilide.** *Production in Germany.* The "Chemist and Druggist" has instituted some inquiries in regard to the production of acetanilide in Germany, and has ascertained that there are no official figures, but from information that has been supplied by several gentlemen specially interested in the manufacture of this product, it appears that the amount annually manufactured is approximately 200,000 kilos, and of this probably about a third is exported. The amount represents, in doses of 6 grains, over 520,000,000 headache powders consumed annually. These figures are extremely interesting in view of the alleged fatalities from acetanilide.—Chem. and Drugg., Jan. 11, 1913, 51.

**Antipyrine.** *Incompatibility with Hexamethylenetetramine.* —C. Mannich observed that solutions of both of these substances, upon the addition of acids, form crystalline precipitates. Inasmuch as hydrochloric acid forms a precipitate at once, therefore, it is to be expected that the same reaction will take place in the stomach by the gastric juices. The formed precipitate is physiologically inactive. The same precipitate is also formed in a solution of antipyrine, ammonium chloride and formaldehyde.—Apoth. Ztg., 1913, 535. (O. R.)

**Apomorphine.** *Question of Spontaneous Formation and Its Detection in Morphine Solutions.*—M. Feinberg finds that when solutions of morphine or its hydrochloride are boiled for a long time, or are left to stand for long periods, with or without addition of nutrient liquids, no formation of apomorphine takes place, notwithstanding statements to the contrary in the literature. The slight precipitation which sometimes occurs is due to morphine. Furthermore, he describes a new and very sensitive test for the detection of apomorphine in presence of morphine: To the solution of morphine to be tested, 3 drops of a 1 per cent. solution of potassium ferricyanide are added, and the mixture shaken with 1 Cc.

of benzine. If apomorphine be present, the benzene becomes colored amethyst-violet, and on addition of a few drops of dilute solution of sodium hydroxide and renewed shaking, a fine violet coloration is developed. Morphine does not interfere with the reaction, and apomorphine may thus be detected when only 0.003 Mgm. per mil is present. *Pharm. Journ. and Pharmacist*, June 7, 1913, 801; from *Zeit. physiol. Chem.*, 84 (1913), 363-378.

**Benzyl Creatinine.**—*Properties.* W. Hennig, continuing the work of E. Schmidt and his students, showing that creatinine is a secondary base, has studied the benzyl derivatives of creatinine and reports on:

**Benzyl Creatinine Hydrochloride**,  $C_4H_6(C_6H_5CH_2)_3N_3OHCl$ , faint yellow crystals, charring without fusion; the gold double salt of same, fine yellow needles, melting at  $158^\circ$ ; the platinum double salt, red crystals, melting at  $177^\circ$ ; and the free base benzyl creatinine,  $C_4H_6(C_6H_5NH_2)_3N_3O$ , pale yellow crystals, melting at  $225^\circ C$ . This base on oxidation with potassium permanganate gave a product that did not give analytical figures agreeing closely with the substance benzyl methyl guanidine that it was expected to obtain, although analysis of the gold and platinum double salts point to the fact that the product obtained was really benzyl methyl guanidine, but not in entirely pure form.—*Arch. d. Pharm.*, 251 (1913), No. 5, 396. (H. V. A.)

**Berberrubin.** *Formation and Derivatives.* Frerichs and Stoepel continued their work on the structure of berberine by study of berberrubin, the body produced when berberine hydrochlorate is heated to  $200^\circ$  with urea. The following derivatives were prepared:

(1) The iodide of *ethyl berberrubin* or homoberberine,  $(C_2H_5O)(CH_3O)C_{19}H_{12}NO_2I$ , made by treating berberrubin with ethyl iodide. Yellow needles, sparingly soluble in water.

(2) **Homoberberine.**—Acetone  $C_{21}H_{20}NO_4CH_2COCH_3$ , made by boiling together "1," half-normal potassium hydroxide and acetone. Crystals melting at  $159^\circ$ .

(3) **Ethylberberrubin Chloride**,  $C_{21}H_{20}NO_4 + 2H_2O$ , made by heating "2" with a diluted hydrochloric acid.

(4) **Tetrahydrohomoberberine**,  $C_{21}H_{23}NO_4$ , from "3" by reduction with zinc and platinum in an acid medium. Light yellow crystals melting at  $129^\circ$ .

(5) **Bromacetic Acid Ethyl Ester of Berberrubin**,  $C_{23}H_{22}NO_6Br$ , made by heating berberrubin with bromacetic

ethyl ester and alcohol for six hours on water bath with invert condenser. Yellow crystals.

(6) **Berberrubin Acetic Acid**,  $C_{21}H_{17}NO_6 + 5H_2O$ , made by treating "5" with moist silver oxide. Somewhat soluble crystals.

(7) **Hydrochloride** of "6," bright yellow crystals.

(8 and 9) Propionic acid combinations of berberrubin similar to "5" and "6."

(10) **Berberrubin Nitrate**,  $C_{18}H_{12}NO_4NO_3$ , by boiling berberrubin with 13% nitric acid. Crystals dark green in reflected light, dark red in direct light.

(11) **Berberrubin Sulphate**, by treating the nitrate with diluted sulphuric acid.

(12) **Berberrubinol**,  $C_{18}H_{13}NO_4$ , by heating the nitrate "10" with diluted sulphuric acid and then treating the resulting bisulphate with sodium bisulphite. To the berberrubinol sulphate thus obtained is added saturated solution of sodium bicarbonate and the dark red precipitate is purified by washing.

(13) **Nitrate of Berberrubinic Acid**,  $C_{18}H_{14}NO_6NO_3$ , made by heating berberrubin with 25% nitric acid followed by crystallization from the concentrated fluid. Occurs in dark red crystals which on treatment with water are split into golden, shining crystals of free

(14) **Berberrubinic Acid**, which treated with hydrochloric acid, form the

(15) **Hydrochloride of Berberrubinic Acid**, which appears in golden crystals.

(16) **Chlorberberrubin**,  $C_{19}H_{14}ClNO_4$ , made by warming berberrubin with solution of chlorinated soda. Very small, dark red crystals, insoluble in most solvents, somewhat soluble in hot anilin.

(17) **Hydrochloride** of "16,"  $C_{19}H_{15}ClNO_4Cl + 3H_2O$ . Orange-yellow crystals soluble in water.

(18) **Aminoethylpiperonylic Acid Lactam Chloride**,  $C_{10}H_8NO_3Cl$ . If, in making chlorberberrubin, enough more solution of chlorinated soda is added to effect solution, the above chemical is produced and crystallizes from the warm solution in colorless needles, melting at  $114^\circ$ . On treatment with sodium sulphite the free lactam (m. p.  $181^\circ$ ) is produced. Berberine hydrochloride by similar treatment with sodium hypochlorite gives the chloride of the lactam just described.

(19) **Tetrahydrochlorberberrubin**,  $C_{19}H_{18}ClNO_4$ , made by re-



duction of chloroberberrubin in a mixture of acetic acid and sulphuric acid with zinc. The bright yellow precipitate thus obtained on titration with a little water and with ammonia carbonate gave the free base, which crystallized from alcoholic solution as reddish gray crystals melting at  $142^{\circ}$ .

(20) **Hydrochloride** of the above ("19") is a white crystalline powder very difficultly soluble in water.

(21) **Chlorberberine**,  $C_{20}H_{18}NO_5$ , by heating chloroberberrubin on water bath with methyl iodide in a sealed tube. This forms the iodide of chlorberberine and from this by treatment with potassium hydroxide and acetone is obtained chlorberberine acetone and from the latter by treatment of an acetone solution with water, chlorberberine is obtained as yellowish crystals melting at  $171^{\circ}$ .

(22) **Bromberberrubine**,  $C_{19}H_{14}BrNO_4$ .

(23) **Bromberberrubine Chloride**,  $C_{19}H_{15}BrNO_4Cl + 3H_2O$ .

(24) **Tetrahydrobromberberrubine**,  $C_{19}H_{18}BrNO_4$ .

(25) **Bromberberine**,  $C_{20}H_{18}BrNO_5$ .

(26) The acetone combinations of "25" were made by methods similar to the corresponding chlorine compounds ("19" to "21" given above). Arch. d. Pharm., 251 (1913), No. 5, 321. (H. V. A.)

**Betaine.**—*Distribution in the Different Parts of Plants.*—V. Stanek, after detailing the method employed for the determination of betaine in plant tissues and its separation from choline, discusses its distribution in the different parts of the plant. Although betaine occurs so widely in the vegetable kingdom, the amount present in an individual plant varies enormously in different organs. In the following four plants the percentages of betaine found in different parts are expressed in percentages on the dry material: *Lycium barbarum*: Young leaves, 3.91; old leaves, 1.62; flowers without calyx, 1.5; young shoots, 1.55; root bark, 0.49; wood, 0.12. *Saccharum officinarum*: Stem, 1.12; seeds, 0.18; leaf blade, 2.68; leaf stalk, 1.38; root, 0.95. *Triticum sativum*, during flowering: Leaves, 0.81; stems, 0.30; inflorescence, 0.28; ripe fruit, 0.09. *Atriplex canescens*: Old leaves, 3.2; young leaves, 5.4; young shoots, 2.12; bark, 2.82. *Amaranthus retroflexus*: Seeds, 0.22; seed coats, 1.32; leaves, 2.16; stem, 1.08; root, 0.48. A notable point brought out in the investigation is the relatively small amount of betaine found in the seeds freed from integuments. There appears to be no definite connection between the amount of total nitrogen present and the nitrogen as betaine. The leaves

are specially rich in betaine, and younger leaves contain more than older. These facts indicate the biological importance of betaine in the life of the plant, and show that it is used up during the process of growth, and that it is not a nitrogenous reserve material.—Pharm. Journ. and Pharmacist, August 23, 1913, 323; from Ztschr. f. Zuckerind., 37 (1913), 385.

**Caffeine.**—*Pharmacology.*—Caffeine seems to have a definite tendency to the formation of habit. Not a little of the restlessness of children during the summer is to be attributed to the taking of caffeine in considerable quantities in the form of soda-fountain drinks.—J. Am. M. Assoc., v. 60, 1308. (M. I. W.)

**Determination of Small Amounts of Caffeine.**—*A Comparison of Methods.*—B. L. Murray submits the results of a number of determinations of small amounts of caffeine from coffee and coffee preparations that have been freed from practically all of their caffeine. The methods of analysis used were those of Görter and of Lendrich and Nottbalm.

The results obtained by the Görter method appear to be much higher than those obtained by the Lendrich and Nottbalm method.

Much lower results were obtained in the Lendrich and Nottbalm method when the impurities accompanying the caffeine were eliminated by treating with potassium permanganate.

The author does not submit any data which would tend to show whether the yield obtained by the two methods is above or below the amount of caffeine actually present.—Journal Ind. and Eng. Chem., August, 1913, vol. 5, 668. (L. A. B.)

**Cinchona Alkaloids.**—*Comparative Extraction in the Different Preparations of the Bark.*—Comparative investigations of different preparations of cinchona bark, comprising fluidextracts, syrups and wines made from the two kinds of bark official in the "Codex" show that the largest percentage of the alkaloids present in the drug are represented in the fluidextracts, the relatively smallest in the wines. The results are exhibited in an instructive table accompanying the original paper, in Journ. d. Pharm. et Chim. (7), viii (1913), No. 4.—Pharm. Ztg., lviii (1913), No. 73, 729.

**Cinchona Alkaloids.**—*New Reaction.*—G. N. Watson gives the following characteristic reaction for cinchona alkaloids, which is not given by any other alkaloid. A few drops of an alcoholic solution of alpha-naphthol, which in 1 Cc. contains two drops of concentrated sulphuric acid, produce a yellow precipitate, which is

soluble in an excess of the reagent. Suedd. Ap. Ztg., 1913, No. 103. (O. R.)

**Quinine.**—*Synthesis.* Dr. E. Remy describes, based upon his researches on cinchona and quinine, the formation of the alkaloid in the plant. He also gives an outline of the synthesis of quinine. — Apoth. Ztg., 1913, No. 15, 137-139. (O. R.)

**Quinine.**—*New Gravimetric Method of Estimation.*—P. T. Krussse, using sodium nitroprusside as a precipitant, proposes the following method for the estimation of the quinine content of cinchona bark: 5.0 Gm. of the powdered bark are moistened with 3.5 Cc. of water and 1 Cc. of ammonia, then mixed with 2.5 Gm. of slaked lime, and the mixture is extracted with acetone in a Soxhlet. The acetone is distilled off, the residue dissolved in 25 Cc. of 2% hydrochloric acid, the acid solution rendered alkaline, and the alkaline solution is shaken out with ether, from which the alkaloid is again extracted with 2% hydrochloric acid and the acid solution is diluted to 50 Cc.; whereupon 0.5 Gm. of ammonium oxalate is added and the mixture set aside to crystallize. The crystals are collected on a filter, washed with a little water and dissolved in 2% hydrochloric acid. The solution is now accurately neutralized and the oxalic acid is removed by the addition of calcium chloride, the calcium oxalate removed by filtration, and the filtrate, after accurate neutralization and heating to 100° C., is precipitated with sodium nitroprusside. The crystalline precipitate is collected on a filter, washed, the filter and beaker dried at 100° C., and the crystals are transferred into the beaker and weighed. The weight so ascertained, multiplied by 1.03, gives the weight of the quinine in 5.0 Gm. of the cinchona. By the treatment with ammonium oxalate, as explained, the cinchonine present in the bark is completely removed. Pharm. Ztg., lviii (1913), No. 13, 128; from Pharm. Weekblad, 1912, No. 49.

**Quinine.** *Thalleio and Erythro Reactions.*—The following method is designed by Harraudeau to get rid of the disturbing influence of oxidizing bodies in the estimation of quinine in any preparation of quinine, and to replace the method of the French Pharmacopœia, which is not only difficult to carry out by the pharmacist, but very costly. Ten Cc. of a solution of quinine sulphate are treated with sufficient solution of ammonia to set free all the quinine; the liquid is then shaken in a separator with 15 Cc. of ether, the ether decanted and evaporated completely

on the water bath; the residue thus obtained is taken up with 10 Cc. of 5 per 1,000 acetic acid solution, the solution placed in a test-tube of 22 Mm. diameter, treated with 0.5 Cc. sodium bisulphite (commercial solution), and 0.5 Cc. of solution of formaldehyde (to render the color stable), then adding, drop by drop, saturated bromine water until the liquid is faintly yellow, but persisting after shaking for a few seconds. For the thalleio reaction, 2 drops of soda solution are added, the liquid shaken, and then treated with 5 or 6 drops of solution of ammonia, shaking again. The green color appears and persists for about six hours, and may be examined colorimetrically. For the erythro reaction, instead of the soda, the same number of drops of solution of potassium ferrocyanide, of 2.5 per cent., are added, and then the bromine water; the liquid is shaken and 1 drop, or at most 2, of solution of ammonia added. The red color appears at once, and is very persistent, though to a less degree than the preceding (about an hour). In both cases the duration of the color is sufficient for colorimetric comparison with a direct solution of quinine sulphate in acetic acid water.—Pharm. Journ. and Pharmacist, May 10, 1913, 663; from Bull. Soc. de Pharm. de Bord., January, 1913, 28.

**Quinine.**—*Treatment of Lobar and Lobular Pneumonia.*—Solomon Solis Cohen reports the recent improvement on the quinine treatment of lobar and lobular pneumonia and the auxiliary use of cocaine, posterior-pituitary extract, and bacterial products. He expresses the belief that when bacterial therapy and serum therapy are sufficiently developed to be applied with precision in supplement to quinine, the mortality of pneumonia will become so small under the combined method as to be negligible.—J. Am. M. Assoc., 1913, v. 61, 107–110. (M. I. W.)

**Quinine.**—*Effect on Rabies in Dogs.*—Of three dogs treated by H. V. Moon, two are alive and healthy and one died of obscure cause two and one-half months after treatment. The control animals in every case died with the characteristic symptoms and pathologic changes of rabies. The dogs were treated with large doses of quinine sulphate several times daily. The dose varied for a six or seven kilogram dog from 1.0 to 1.6 Gm. usually in three doses ("Journal of Infectious Diseases," July, 1913, Ser. III, No. 1).—J. Am. M. Assoc., 1913, v. 61, 511. (M. I. W.)

**Quinine and Urea Hydrochloride** has the formula  $C_{20}H_{24}N_2O_2 \cdot HCl + CH_4N_2O \cdot HCl + 5H_2O$ . It has the effect of other quinine



compounds and is no more poisonous than quinine itself. —J. Am. M. Assoc., v. 60, 147. (M. I. W.)

**Quinine and Urea Hydrochloride.**—H. A. Cables reports eight cases of sciatica treated with a four per cent. solution of quinine and urea hydrochloride in normal salt solution. There were 50 injections in all but no untoward results other than a little soreness that always follows hypodermic injections. Seven patients received six injections each and one received eight. —J. Am. M. Assoc., 1913, v. 61, p. 2303. (M. I. W.)

**Quinine Esters.**—*Chemistry.*—Woldemar Thomson has prepared an excellent article on the chemistry of esters of quinine. These preparations which are practically tasteless are intended to replace quinine which is very objectional on account of its bitter taste. Euquinine was introduced in 1896 by von Noorden and saloquinine by Overlach in 1901 which was followed by aristochin, in 1902. Aristochin or aristoquinine is chemically diquinine carbonic ester or quinine carbonate, the neutral carbonic acid ester of quinine. It is prepared by heating together one molecule of quinine and two molecules of phenol carbonate, whereby diquinine carbonate is formed and phenol is liberated. Aristochin contains theoretically 96.1 per cent. quinine. Practically the author has found 95.16 per cent.

Euquinine or euchinin or quinine ethyl carbonate, is the quinine ester of ethyl carbonic acid ester. It is manufactured by the action of chlorocarbonic ethyl ester on quinine in the presence of alkali. According to its formula, euquinine contains 81.8 per cent. of quinine. The author has found 78.84 per cent.

Saloquinine or salichinin or quinine salicylate is the salicylic acid ester of quinine. It is manufactured by heating a mixture of phenyl salicylate or salol with anhydrous quinine in a vacuum, whereby quinine salicylic acid ester is formed and phenol liberated. According to its chemical formula, saloquinine contains 73.1 per cent. of quinine. The author has found 72.1 per cent. quinine and 25.92 per cent. of salicylic acid.

Besides the genuine products, a number of substitutes were also examined and the following conclusions were reached:

1. The saponification of the quinine esters with alcoholic sodium hydroxide is complete.
2. The percentage of quinine in the analysis of the original preparations is almost identical with the theoretical percentage.

3. The percentage of quinine in the substitutes is less than in the original products.—Ph. Zhalle., 1913, No. 50. (O. R.)

**Oxyquinolines.**—*Synthetic Production and Characters.*—In 1899 Camp showed that acetylorthoamidopropiophenone not only gave a line of amidoaldehydes, amidoketoacids and amidoacids, but also that it could be condensed into quinoline derivatives. Dr. E. Wohnlich, a former student of Camp, has recently conducted a similar line of investigation starting with the orthoamidopropiophenol and he has obtained the following results:

1. **Orthoamidopropiophenone** was prepared by reduction of orthonitropropiophenone, with tin and concentrated hydrochloric acid; the nitrophenone is made by first treating orthonitrobenzoyl chloride with sodium methylacetoacetic ether, whereby orthobenzoylmethylacetoacetic ester is formed and this on saponification with sulphuric acid (1 part of concentrated acid to 2 parts of water) yields a mixture of orthonitrobenzoic acid and the nitrophenone, which is obtained as a thick yellow aromatic oil boiling at  $175^{\circ}$  C. at 25 Mm. pressure. Amidopropiophenone is obtained in shining yellow-white scales melting at  $45^{\circ}$  to  $46^{\circ}$  and from it was prepared by treatment with appropriate anhydrides the following "acidyl" compounds:

2. **Acetylorthoamidopropiophenone**,  $\text{CH}_3\text{CONHC}_6\text{H}_4\text{COC}_2\text{H}_5$ , colorless rhombohedric tablets melting at  $71^{\circ}$ .

3. **Propionylorthoamidopropiophenone**,  $\text{C}_2\text{H}_5\text{CONHC}_6\text{H}_4\text{COC}_2\text{H}_5$ , rhombohedric crystals melting at  $51^{\circ}$ .

4. **Butyrylorthoamidopropiophenone**,  $\text{C}_3\text{H}_7\text{CONHC}_6\text{H}_4\text{COC}_2\text{H}_5$ , large rhombohedric crystals melting at  $39^{\circ}$ – $40^{\circ}$  C.

5. **Benzoylorthoamidopropiophenone**,  $\text{C}_6\text{H}_5\text{CONHC}_6\text{H}_4\text{COC}_2\text{H}_5$ , white needles, melting at  $130^{\circ}$  C. In the saponification of orthobenzoylmethylacetoacetic ether described above, besides the nitrophenone and orthonitrobenzoylchloride there were obtained two crystalline bodies, one melting at  $124^{\circ}$  to  $125^{\circ}$  C. and the other at  $74^{\circ}$  to  $75^{\circ}$  C. The four "acidyl" derivatives of amidopropiophenone (Nos. 2 to 5) were condensed by treating each with alcohol, water and sodium hydroxide, when the following quinoline derivatives were obtained:

6. **Oxydimethylquinoline**,  $\text{C}_9\text{H}_4\text{N}(\text{OH})(\text{CH}_3)_2$ , from "2" in crystals melting at  $330^{\circ}$ .

7. **Oxyethylquinoline**,  $\text{C}_9\text{H}_5\text{N}(\text{OH})(\text{C}_2\text{H}_5)$ , also from "2," in

columnar crystals melting at  $197^{\circ}\text{C}$ . The hydrochlorate, picrate and platinate of this body were also prepared and studied.

8. **Oxyethylmethylquinolines**,  $\text{C}_9\text{H}_4\text{N}(\text{OH})(\text{CH}_3)(\text{C}_2\text{H}_5)$ , were obtained from "3," one melting at  $297^{\circ}\text{C}$ . and another at  $188^{\circ}\text{C}$ . Picrates, hydrochlorates and platينات of these bases were also prepared.

9. **Oxydiethylquinoline**,  $\text{C}_9\text{H}_4\text{N}(\text{OH})(\text{C}_2\text{H}_5)_2$ , from "4," melting at  $174^{\circ}$ – $175^{\circ}\text{C}$ .

10. **Oxymethylpropylquinoline**,  $\text{C}_9\text{H}_4\text{N}(\text{OH})(\text{CH}_3)(\text{C}_3\text{H}_7)$ , also obtained from "4," in long white needles melting at  $275^{\circ}\text{C}$ . From these two, picrates and platينات were prepared.

11. **Phenylmethyloxyquinoline**,  $\text{C}_9\text{H}_4\text{N}(\text{OH})(\text{CH}_3)(\text{C}_6\text{H}_5)$ , obtained from "5," as white cubical crystals melting at  $276^{\circ}\text{C}$ . These several oxy-quinolines were then reduced to the corresponding quinolines, *viz.*:

12. **Dimethylquinoline**, from "6."

13. **Ethylquinoline** from "7."

14. **Propylmethylquinoline** from "10."

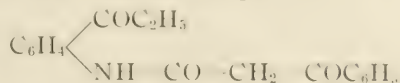
15. **Methylethylquinoline** from "8."

16. **Diethylquinoline** from "9."

While treatment of orthoamidopropiophenone with the appropriate acid anhydrides yields acidyl derivatives (Nos. 2 to 5 above, which in turn condensed to both alpha and gamma quinoline derivatives), condensation of the phenone with acetoacetic ester or benzoyl acetic ester gave directly quinoline compounds and these of the alpha variety only. Thus, acetoacetic ester gave

17. **Oxyacetylethylquinoline**,  $\text{C}_9\text{H}_4\text{N}(\text{OH})(\text{C}_2\text{H}_5)(\text{COCH}_3)$ , in fine needles melting at  $198^{\circ}$ – $199^{\circ}\text{C}$ .; while benzoyl acetic ester yielded

18. **Oxybenzoylethylquinoline**,  $\text{C}_9\text{H}_4\text{N}(\text{OH})(\text{C}_2\text{H}_5)(\text{COC}_6\text{H}_5)$ , in short needles melting at  $213^{\circ}\text{C}$ . In preparing this, under certain precautions, an amido intermediate product



can be obtained. Arch. d. Pharm., 251 (1913), No. 7, 526. (H. V. A.)

**Arabinates of the Cocaine Bases.**—*Advantages over Other Forms for Local Anesthesia.* Erhardt uses the arabinates of the cocaine bases for producing lumbar anesthesia, since they cause much less marked signs of intoxication by resorption into the dural space

than the hydrochlorides usually employed for the purpose. Anæsthesia with arabinates does not affect the motor nerves; with the hydrochlorides these are paralyzed. The insensibility to pain produced by the former is twice to four times more prolonged than with the use of the latter. The arabinates produce a markedly less intense fall in the blood pressure than the hydrochlorides, so that a quantity of a cocaine base, which, as an arabinate, would lessen the arterial pressure by 50 per cent., would be mortal if given in the form of hydrochloride.—*Pharm. Journ. and Pharmacist*, October 4, 1913, 497; from *Nouv. Remèdes*, 30 (1913), 348.

**Ephedrin.**—*Optical Activity.*—K. Schmidt discusses the optical activity of the isomeres, ephedrin and pseudo-ephedrin, and the asymmetric carbon atom on which this activity depends. It has been claimed that the carbon of the CHOH group in the formula  $C_6H_5CHOH-CH(NHCH_3)-CH_3$  was the one; but Schmidt finds that when the hydroxyl is replaced by a hydrogen atom, thus forming a  $CH_2$  group, which of course is not asymmetric, the alkaloids still remain optically active. He, therefore, thinks that the optical activity is due to the  $CH(NHCH_3)$  group although he finds the asymmetric carbon atom in the CHOH group does in slight degree exert an optical influence. *Arch. d. Pharm.*, 251 (1913), No. 4, 320. (H. V. A.)

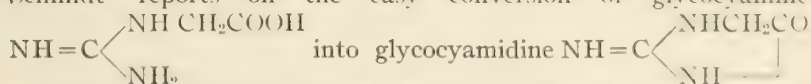
**Ethylmorphine.**—*Melting Point.*—Referring to a paper on ethylmorphine published by G. L. Schaefer in the "*Amer. Jour. Pharm.*" D. B. Dott observes that while Mr. Schaefer notes that neither the base nor its hydrochloride has a definite melting point, no reason is suggested for this except the presence of traces of impurity. It has, in the first place, to be remembered that neither the alkaloid nor its hydrochloride are anhydrous at  $100^\circ C$ . If they are carefully dried before taking the melting point the first appearance of melting is not observed at such low temperatures as  $88^\circ C$ . for the base, and  $110^\circ C$ . for the hydrochloride. But Mr. Dott quite agrees that a well-defined melting point is not obtained even with the purified and carefully dried base, for even at  $110^\circ$ – $115^\circ C$ . the base quickly darkens in color, and after a moderate exposure is extensively decomposed. He thinks that it is this readiness to decompose on heating that prevents an accurate observation of melting point. The hydrochloride shows a similar tendency to decompose under its true melting point, so that the observation is obscured or rendered impossible. The temperature  $124^\circ C$ . usually given is too high for the fully hydrated salt, and too low



for the salt dry at  $115^{\circ}\text{C}$ . When some of the recrystallized hydrochloride was dried at  $120^{\circ}$ – $125^{\circ}\text{C}$ . it did not melt till the temperature was about  $170^{\circ}\text{C}$ . It would, perhaps, be more correct to say that its product of decomposition melted at about that temperature. Pharm. Journ. and Pharmacist, January 25, 1913, 99.

**Crude Gelseminine.**—*Possible Constituents.*—In a former paper (see Proceedings, 1911, 485), L. E. Sayre called attention to a base associated with crude gelseminine, for which he proposed the name "*gelsemoidine*" if on further experimentation its existence as a distinct base should be proven. He now reports the results of further investigations which seem to show that the two amorphous bases, which he has again obtained from "crude gelseminine" prepared from 50 lbs. of the drug, are apparently identical, the difference in their solubilities—the one soluble in weak alkali, the other not—being due to the presence of gelsemic acid in one of them. The two substances when tested by the usual alkaloidal reagents, gave identical reactions, and physiological tests subsequently confirmed their identity. Nevertheless, that there are two alkaloids in the amorphous substance is apparently confirmed by the investigation of C. W. Moore (Year Book, 1912, 168), who reports the existence of two amorphous alkaloids besides crystalline gelsemine, in gelsemium. The author proposes to continue his researches.—Journ. A. Ph. A., April, 1913, 436–437.

**Glycocyamidine.**—*Easy Conversion from Glycocyammine.*—E. Schmidt reports on the easy conversion of glycocyammine



by preparing glycocyammine by heating guanidine carbonate with glycocholl in the presence of the concentrated sulphuric acid, then diluting with water, making alkaline with sodium hydroxide, then acidulating with acetic acid and then treating with sodium acetate and mercuric chloride. This causes the precipitation of a double chloride of mercury and glycocyamidine and when this is suspended in water warmed and treated with hydrogen sulphide gas, the mercury is precipitated and glycocyamidine chloride goes into solution. This is evaporated to dryness by crystallization from boiling alcohol in small colorless needles, turning brown at  $200^{\circ}$  and melting at  $208^{\circ}$  to  $210^{\circ}\text{C}$ . From this substance the free base and its silver, platinum and gold compounds were obtained and analyzed. Arch. d. Pharm., 251 (1913), No. 7, 557. (H. V. A.)

**Guanine.**—*A Pancreas Constituent Antagonistic to Adrenine.*—According to Desgrez and Dorleans, the base guanine, which is found in many internal glands, but principally in the pancreas, has the property of lowering the arterial pressure, and is, in a certain measure, an antidote to the toxicity of adrenine. It greatly reduces the glycosuria caused by the administration of that alkaloid. Since the pancreas is rich in proteids which form guanine, and also contains a notable amount of the free base, there is every reason to suppose that guanine plays an important part in the glycaemic control exercised by that organ. When administered by injection to guinea pigs and rabbits, after a lethal dose of adrenine has been injected, guanine greatly lengthens the time before a fatal result ensues. —Pharm. Journ. and Pharmacist, December 27, 1913, 949; from Compt. rend., 157 (1913), 946.

**Hexamethylenetetramine.**—*Liability of Error in Test for  $H_2SO_4$ .*—R. Richter calls attention to the observation that in making the test for  $H_2SO_4$  in hexamethylenamine with barium nitrate T. S. a turbidity always manifests itself, which on addition of acids disappears. He expresses the opinion that this turbidity or precipitation is due to the formation of a complex hexamethylenamine compound with the barium salt, and recommends the preliminary acidification of the solution with nitric acid when testing for sulphuric acid. This is explained in the next article. Pharm. Ztg., lviii (1913), No. 19, 189.

**Hexamethylenetetramine.** *Cause of Turbidity when Applying the Barium Nitrate Test.* G. Maue, in a rejoinder to the above, contradicts the opinion of Richter regarding the cause of precipitation and character of the precipitate resulting on the addition of barium nitrate T. S. Moreover, he finds that the turbidity (resp. precipitation) is not always produced, but that when it does so in the absence of  $H_2SO_4$ , it is due to the presence of free alkali in the hexamethylenetetramine (ammonium, carbonates, etc.). It suffices, therefore, to add a little nitric acid *after* precipitation or turbidity has occurred.—Ibid., No. 26, 259.

**Hexamethylenamine Silver Salts.**—*Enumeration and Composition.* Vanino and Sachs have prepared and describe the following silver compounds of hexamethylenetetramine:

**Silver Fluoride Compound,**  $C_6H_{12}N_4AgF \cdot 3H_2O$ , fine white needles.

**Silver Chloride Compound,**  $C_6H_{12}N_4AgCl$ , hard prismatic crystals.

**Silver Bromide Compound,**  $C_6H_{12}N_4 \cdot 3AgBr$ , fine crystalline powder.

**Silver Iodide Compound,**  $C_6H_{12}N_4 \cdot 3AgI$ , fine crystalline powder.

**Silver Chlorate Compound,**  $C_6H_{12}N_4 \cdot AgClO_3 \cdot H_2O$ , white precipitate, rather soluble in water.

**Silver Oxalate Compound,**  $C_6H_{12}N_4 \cdot Ag_2C_2O_4$ , fine acicular crystals.

Each of these compounds was assayed for silver and was submitted to analysis by combustion. *Arch. d. Pharm.*, 251 (1913), No. 4, 290. (H. V. A.)

**Hexamethylenamine.** *Not a Harmless Drug.* W. Cuntz states that this drug (urotropin) cannot be regarded as absolutely harmless. With the usual dosage he has witnessed hematuria and albuminuria develop in two cases. In the first the bladder was evidently seriously irritated; in the second case of albuminuria, leucocytes and epithelial cells were found in the urine after administration of hexamethylenamine, subsiding on suspension of the drug and returning on its resumption.—*Münch. Med. Wschr.*, 1913, 40, No. 30; *J. Am. M. Assoc.*, 1913, v. 61, 815. (M. I. W.)

**Synthetic Hydrastinine.**—*A Cheap Substitute for Natural Hydrastis Preparations.* A German manufacturing firm has succeeded in preparing synthetic hydrastinine, the oxidation product of hydrastine, and has placed it on the market as an economical substitute for the increasingly expensive preparations of hydrastis, over which it has the further advantage of avoiding the nauseous taste of the natural products. The synthetic product is obtained by a method suggested by Becker, and is supplied in two forms: *Liquor hydrastinini synthetici*, and *Tablette hydrastinini synthetici*—the latter containing 0.025 Gm. of the medicament in each tablet. It is claimed that the synthetic product, in either form, possesses the full therapeutic activity of the natural drug or of the corresponding natural products.—*Pharm. Ztg.*, lviii (1913), No. 28, 275.

**Hydroxylamine.**—*Criticism of Assay Methods Proposed.*—Rupp and Mader publish a critique of the several suggested methods of assay of this chemical. They find that Meyeringh's method—treatment of it with tenth-normal iodine in the presence of magnesia or of sodium phosphate followed by titration of excess of iodine with tenth normal thiosulphate V. S. is very inaccurate; that Raschig's method—reduction of Fehling's solution by hydroxyl-

amine and estimation of the precipitated cuprous oxide either by weighing or by volumetric means through use of ferric alum, and permanganate V. S.—is useful but complicated; that the method of the "Ergänzungsbuch" of the German Pharmacopœia—treatment with Koppelschaar's solution and potassium iodide and titration of liberated iodine with tenth-normal thiosulphate V. S.—gives accurate results; and that still better figures are obtained by the Dehn method in which alkaline hypobromite solution is substituted for Koppelschaar's solution. The article closes with details of manipulation of the latter assay.—Arch. d. Pharm., 251 (1913), No. 4, 295. (H. V. A.)

**Ipecacuanha Alkaloids.**—*Chemical Investigation.*—In a preliminary note to the "Chemical Society," F. H. Carr and F. L. Pym give some of their principal conclusions derived from an extended investigation of emetine and cephaeline. A large number of analyses of emetine, and of its hydrochloride, hydrobromide, hydriodide, and nitrate, indicate the formula  $C_{29}H_{40}O_4N_2$  for this base. This formula is also in better agreement on the whole with the few results obtained by previous investigators than any of the formulæ suggested by them. Cephaeline is probably correctly represented by the formula  $C_{28}H_{38}O_4N_2$ . These formulæ, which are supported by molecular weight determinations, indicate that each alkaloid contains two nitrogen atoms. In the stable neutral salts the bases are combined with two equivalents of acid. Evidence of the existence of basic salts has also been adduced. In each base both nitrogen atoms are present as imino-groups; and these alkaloids are, therefore, dissecondary bases. Emetine contains four, and cephaeline three, methoxyl groups, while the latter also contains a phenolic hydroxyl group. All the oxygen atoms contained in them are thus accounted for. Both alkaloids are optically active, the bases being levorotatory, emetine having  $[\alpha]_D - 22^\circ$ , and cephaeline  $[\alpha]_D - 18^\circ$ , while the salts are dextrorotatory, anhydrous emetine hydrochloride  $[\alpha]_D + 16^\circ$  corresponding with  $[\alpha]_D + 18^\circ$  for the basic ion. Emetine yields, on oxidation with ferric chloride in aqueous solution, a scarlet, crystalline hydrochloride, which is termed *rubremetine hydrochloride*. Being formed by the removal of eight hydrogen atoms from emetine, it has the formula  $C_{29}H_{32}O_4N_2 \cdot HCl \cdot 6H_2O$ . It melts at  $127^\circ$  to  $128^\circ$  (corr.), contains four methoxyl groups, and is monobasic. When emetine is oxidized with a large amount of potassium permanganate in aqueous acetone solution, 6 : 7-dimethoxy-isoquinoline-1-carboxylic acid is formed, identical, with the substance previously



obtained by Goldschmidt by the oxidation of papaverine; *m*-hemipinic acid has also been observed among the oxidation products. Cephaeline, on oxidation, behaves differently from emetine, ferric chloride giving rise to two crystalline oxidation products: (1) a *hydrochloride*,  $C_{21}H_{21}O_7N_2 \cdot HCl \cdot 5H_2O$ , melting at  $249^\circ$  to  $250^\circ$  (corr.), and containing three methoxyl groups, but no hydroxyl group; (2) a *hydrochloride*,  $C_{17}H_{21}O_6N \cdot HCl \cdot 4H_2O$ , melting and decomposing at  $158^\circ$  (corr.), after drying at  $100^\circ$ , and containing two methoxyl groups and a hydroxyl group. A crystalline *n*-methyl derivative of cephaeline, melting at  $194^\circ$  (corr.), has also been obtained. Chem. and Drugg., July 5, 1913, 2; from Proc. Chem. Soc., No. 418, 226.

**Emetine Hydrochloride.**—*Properties.*—This is a hydrochloride,  $C_{30}H_{44}N_2O_4 \cdot 2HCl \cdot 2H_2O$ , of an alkaloid found in *Cephaelis ipecacuanha*. It occurs as a white crystalline powder, soluble in water and alcohol. The aqueous solution of emetine hydrochloride is practically neutral toward litmus. The general alkaloidal reagents precipitate emetine, even from dilute solutions. Alkalies precipitate emetine from aqueous solutions of its salts. A freshly prepared concentrated solution of ammonium molybdate in concentrated sulphuric acid (Froehde's reagent) is colored green by emetine hydrochloride.—J. Am. M. Assoc., 1913, v. 61, 27. (M. I. W.)

**Emetine.**—*Use in Treatment of Amebic Dysentery.*—William Allan reports several cases of amebic dysentery successfully treated with emetine.—J. Am. M. Assoc., v. 60, 664–665. (M. I. W.)

**Lycorine and Narcissine.**—*Practical Identity.*—Asahina and Sugii discuss the similarity existing between lycorine obtained by Morishima from *Lycoris radiata* and narcissine extracted from *Narcissus tazetta* by Yamanouchi and from *Narcissus pseudo-narcissus* by Ewins. Their tabulation of the data regarding these two alkaloids indicates their identity which is further proven by a new examination of lycorine by Asahina and Sugii, the constants obtained by them from its study agreeing in practically all respects with data given by Ewins for narcissine. Arch. d. Pharm., 251 (1913), No. 5, 357. (H. V. A.)

**Opium Alkaloids.**—*Antagonism to the Action of Apomorphine.*—V. J. Ruth observes that very small doses of morphine, codeine, heroin, or thebaine—much less than will have a general narcotic action—will effectually arrest and neutralize the emetic action of apomorphine. Papaverine, however, does not have this action,

nor does cryptopine. Harnack has already shown that chloroform and chloral hydrate, as well as morphine, are antagonistic to apomorphine. But the two former only so act when given in sufficient doses to exert their full narcotic action. In this respect they totally differ from the above-named opium alkaloids, which are active in relatively minute doses. —Pharm. Journ. and Pharmacist, September 20, 1913, 437; from Pflueger's Archiv., through Nouv. Remèdes, 30 (1913), 346.

**Morphine.** *Estimation in Opium Preparations.*—In view of the fact that superior results have been frequently observed with the Dowzard manipulation when carrying out morphine estimation by the use of the slime method, Harold R. Jensen has considered it necessary to further investigate the matter, in particular as far as morphine estimations in the tincture are concerned, in order that such higher results may be justified. The author elucidates the reasons for the variations observed, mentions the details of his experiments, and records the results in a number of tables. Incidentally, also, he mentions that the conclusions reached are similar to those recently reached by Débourdeaux (see Year Book, 1912, 204) as to the mechanical interferences exerted by sugars, gums, and starches in the case of raw opium estimations. The conclusions reached by their investigation are that a Dowzard morphine figure of 0.75 (deduced from the official (B. P.) correction) may be finally corrected to 0.725 per cent. absolute morphine; and that the Dowzard manipulation should be modified as follows: Evaporate 100 Cc. of tincture to 25 Gm. on a water bath, in a porcelain dish, which, on cooling, is then suitable for directly intimately mixing 3 Gm. of pure  $\text{CaH}_2\text{O}_2$  by means of a small pestle, then transfer with the aid of water to a flask graduated at 102 Cc., and shake well seven or eight times in the half hour's digestion, filter off and pipette 50 Cc. to an oval flask, with 30 Cc. ether, 5 Cc. 90 per cent. alcohol, and 2 Gm.  $\text{NH}_4\text{Cl}$ . Shake thirty minutes, stand over night, remove ether layer with a straight pipette, through interleaved filter papers, shake the residual in the flask with 15 Cc. ether, again pipette off and wash papers with 5 portions, each of 5 Cc. ether (0.720), evaporate the ether from the papers, and then filter the aqueous residual, transferring the morphine finally, and washing the pipette, etc., with 100 Cc. morphinated water. Dry the filter papers to the utmost extent by identical compression and absorption with about 3.8 Sq. Cm. filter paper, or until the basic value of the outer paper is reduced to at least 0.2 Cc. N 10 acid. Then digest each paper in a strong glass

beaker with 20 Cc. N/10  $\text{H}_2\text{SO}_4$ , pulp the papers thoroughly, dilute with water and back titrate with N/20  $\text{NaOH}$ , indicating with the minimum amount of methyl orange. — Pharm. Journ. and Pharmacist, December 13, 1913, 876-877.

**Morphine.** — *Determination in Opium Preparation by the Method of the "Codex."* M. Leclère has made some experiments which demonstrate the possibility of error in the results obtained by the method of the French Pharmacopœia for determining the morphine in opium preparations. This method is based upon the property of morphine to dissolve in solutions of alkali hydroxides, and its insolubility in ammonia. It is well known, however, that morphine is not completely insoluble in water, and particularly in the presence of ammonia. It seemed quite possible, therefore, that a loss of morphine, attributable to this source, might occur, which under circumstances might be far from negligible. Experiments made by the author confirmed the correctness of this assumption. The loss in the assay by the "Codex" method, calculated on the total morphine content, was: 6.4% in the case of opium, 8% in the case of opium extract, and 8% in the case of *Tinct. opii crocata*. Pharm. Ztg., lviii (1913), No. 82, 820; from Répert. de Pharm., 1913, No. 9.

**Morphine.** — *Determination in Acid Liquids.* — Débourdeaux recommends the following modification of the lime method recommended for the morphinometric valuation of such acid liquids as Sydenham's laudanum, the *Vinum Opii Compositum* of the French Pharmacopœia. One hundred and fifty Cc. are treated with excess of milk of lime, made up to 300 Cc., filtered, and washed with 50 Cc. of water. The filter and precipitate is then suspended in another 150 Cc. of water, again filtered and washed with three successive 50 Cc. of water. The bulked filtrate is treated with a current of carbon dioxide, and any precipitate obtained is filtered out and washed with water saturated with carbon dioxide. The total filtrate is evaporated to a small volume, and transferred with any precipitate it may contain to a beaker and reduced to 100 Cc. on the water bath. When cold, 50 Cc. of ether, specific gravity 0.720, and 10 Cc. of N  $\text{AmOH}$  solution are added, and the mixture is set aside for twenty-four hours in a cool place. The ether is then decanted, and the aqueous liquid filtered to collect the morphine. The beaker and precipitate are then washed with five successive Cc. of ether-saturated morphinated water. It is well to add another 2.5 Cc. of N  $\text{AmOH}$  to the total filtrate

thus obtained, and to set it aside for a further twenty-four hours, to allow any morphine which may be present to separate. The filter containing the precipitate is then returned to the beaker, and dried at  $100^{\circ}$  C. The dry crude morphine is then treated with 5 Gm. of slaked lime suspended in 118 Cc. of distilled water. After complete solution, the mixture is filtered: 120 Cc. of this filtrate are equivalent to the original 150 Cc. of liquid taken. That volume, or an aliquot part, is treated with 10 per cent. by volume, of alcohol, 95 per cent., 50 per cent. of ether, specific gravity 0.720, and 2 per cent., by weight, of ammonium chloride. The whole is set aside for twenty-four hours. The precipitated morphine is then collected in the usual manner on a tared Gooch crucible, washed with morphinated water, dried at  $100^{\circ}$  C., washed with petroleum ether, again dried at  $100^{\circ}$  C. and weighed. The necessary correction for the solubility of morphine in the filtrate is then made and added to the weight found.—Pharm. Journ. and Pharmacist, December 13, 1913, 881; from Journ. de Pharm. et Chim., 1913, 8, 424.

**Morphine.**—*Danger of Its Combination with General Anæsthesia.*

Experimental research of W. Straub has confirmed the assumption that the injurious action of morphine on the respiration center may be intensified to a dangerous extent by an anæsthetic-like chloroform which acts likewise on the respiration center. Ether has the opposite effect on the respiration center, stimulating it to increased functioning. He concludes that, when morphine is given, chloroform had better be avoided and ether used for the general anæsthetic. (Münchener Medizinische Wochenschrift, 1913, v. 60, 1809–1864.)—J. Am. M. Assoc., 1913, v. 61, 1082. (M. I. W.)

**Morphine.** *Excretion.*—In the case of morphine, one of the most widely used alkaloids and likewise one of the most abused, the supposition has long prevailed that it is not excreted by the kidneys to any noteworthy extent, but that in so far as it leaves the body unchanged this alkaloid is eliminated through the intestinal tract. A careful reinvestigation of the excretion of morphine conducted at the pharmacologic institute of Heffter in Berlin with more approved methods of quantitative analysis indicates that it will be necessary to revise our beliefs in this matter. As much as 39 per cent. of the morphine introduced into the body may reappear in the urine so that evidently the participation of



the kidneys in the excretion of this alkaloid is by no means negligible.—J. Am. M. Assoc., 1913, v. 61, 972. (M. I. W.)

**Morphine and Narcotine.**—*Comparative Solubility in Acetone and in Water.*—G. Guerin finds that at 15° C., 1000 Cc. of chemically pure anhydrous acetone dissolve 1.28 Gm. of morphine, pure and crystallized (containing 1 molecule of water of crystallization). Narcotine, at the same temperature, is dissolved to the extent of 41.96 Gm. per liter. Aqueous solutions of acetone (made of equal volumes of the two liquids), dissolve, respectively, 0.70 Gm. of narcotine, and 1.32 Gm. of morphine per liter at 15° C. Narcotine is almost insoluble in distilled water, which dissolves only 0.1 Gm. per liter at 15°, but notwithstanding what has been said to the contrary, morphine is much more soluble, and is dissolved in the proportion of 0.288 Gm. per liter. —Pharm. Journ. and Pharmacist, May 31, 1913, 769; from Journ. de Pharm. et Chim., May 1, 1913, 438.

**Morphine-Narcotine Meconate.**—*Investigation Regarding Its Composition.*—D. B. Dott has prepared the double salt of morphine and narcotine meconate by the process recently described and subjected it to investigation. The salt is prepared by dissolving morphine, narcotine, and meconic acid in equi-molecular proportions, in alcohol, and adding ether to cause separation. The precipitated substance so obtained is soluble in cold water, and when air-dry is said to have the composition indicated by  $C_{17}H_{19}NO_3 \cdot C_{22}H_{23}NO_7 \cdot C_7H_4O_7 \cdot 4H_2O$ . A mixture of the alkaloids and acid in molecular proportion, in powdery form, is not perfectly soluble in cold water. A small quantity of salt was prepared in the manner described, and dried at about 45° C. As meconic acid can be titrated when in combination with alkaloids when phenolphthalein is used as indicator, the acid was simply estimated by titration with N/10 soda. An approximate estimation of morphine may be made by titrating when cochineal is used as indicator, but the end point is not very distinct. The salt was dried in the water bath and loss noted. It cannot be dried above 100° C., as it then loses  $CO_2$  from the meconic acid.

Calculated for $C_{17}H_{19}NO_3 \cdot C_{22}H_{23}NO_7 \cdot C_7H_4O_7 \cdot 4H_2O$ .	Found.
Morphine.....	29.38
Narcotine.....	42.57
Meconic acid.....	20.61
Water.....	7.42
	<hr/>
	99.98
	<hr/>
	100.0

After allowing 10.98 of acid for combination with the morphine, 13.62 parts remain. But the narcotine only requires 9.34 for its equivalent quantity, leaving 4.28 of excess. This is nearly half the amount extra, required to convert the narcotine into acid salt. Apparently because of the peculiar nature of meconic acid, which borders on tribasicity, and was for long regarded as tribasic, the excess is sufficient to render the salt quite soluble. It has also to be noted that the morphine is in excess of the narcotine, considered in molecular proportion. Although the salt varies from the composition it is supposed to possess, there is not, from the medicinal point of view, a serious difference between the two sets of figures.—Pharm. Journ. and Pharmacist, January 25, 1913, 99.

**Morphine Glucoside.**—*A New Compound.*—While glucosides having alkaloidal characters are at present but little known, solanin and achillein being examples, C. Mannich concluded that from its structure the morphine molecule would be capable of forming a glucose combination. Such was found to be the case. Starting with morphine in solution in sodium carbonate solution and acetobromo glucose dissolved in acetone, morphine glucoside,  $C_{17}H_{18}NO_3 \cdot C_6H_{11}(O_5 \cdot H_2O)$ , has been obtained in well-formed, bitter needles. Contrary to the rule that such glucosides are more active physiologically than the components they yield on hydrolysis, morphine glucoside shows only the physiological action of the morphine it contains.—Pharm. Journ. and Pharmacist, March 15, 1913, 367; from Liebig's Annalen, 394, 223.

**Phenacetin.**—*Historical Note of Its Discovery.*—C. Duisburg gives an interesting account of the discovery of phenacetin. He says that in 1885 the "Elberfelder Farbenfabriken" succeeded in manufacturing the first technically valuable blue azo-coloring matters, for which purpose large quantities of diamidodiphenol-methyl ether were required. The preparation of this compound, which is commercially known as

**Dianisidin**, consists in the conversion of phenol into ortho- and paranitrophenol, separation of these isomers by distillation with steam, methylation of the orthonitrophenol potassium in alcoholic solution with methyl chloride, reduction of the orthonitroanisole with zinc dust and alkali, and conversion of the hydrazo compound formed into dianisidin by treatment with hydrochloric acid. It was found that by this process 100 Kgm. of phenol yielded uniformly (in addition to 55 Kgm. of orthonitrophenol) 50 Kgm. of

**Paranitrophenol**, for which, however, there was no use. In 1886, O. Hinsberg, having entered the laboratory of the Elberfelder Farbenfabriken, endeavored to utilize this by-product. He prepared the previously known and described acetylparamidophenol-methyl ether, and also the corresponding phenetidid—the ethyl ether—and deputed Prof. Kast, in Freiburg, to make a comparative pharmacological examination of these two products and of acetanilid. It was purely accidental, therefore, that the inferior toxicity of the “paraacetphenetidid,” as compared with that of acetanilid, was discovered. The new product was at once introduced and marketed under the name of “phenacetin.” Pharm. Ztg., lviii (1913), No. 40, 397; from Ztschr. f. angew. Chem., 1913, 240.

**Phenolsulphonephthalein.**—*Use in Estimating the Functional Activity of the Kidneys.*—Charles Goodman, in a further contribution on the value of phenolsulphonephthalein, concludes that the findings in regard to the value of this test, both from a diagnostic and prognostic standpoint, in nephritis confirm previous conclusions.—J. Am. M. Assoc., 1913, v. 61, 184-189. (M. I. W.)

**Phenolsulphonephthalein.**—M. Fishbein reports a number of observations on the use of phenolsulphonephthalein as a functional test of the kidneys in scarlet fever. In the cases reported the dye was injected intramuscularly and elimination determined by the use of the colorimeter described by Cabot and Young (Boston Med. and Surg. Jour., 1911, clxv, 549).—J. Am. M. Assoc., v. 61, 1368-1370. (M. I. W.)

**Phenolsulphonephthalein.**—*Test for Renal Function.*—According to J. T. Geraghty, the kidneys lend themselves particularly well to estimation of function on account of the ease with which their excretions can be obtained and the whole question of the accuracy of the phenolsulphonephthalein test, therefore, resolves itself into the question as to whether a knowledge of the renal functions is of any value. The phenolsulphonephthalein test has been employed now in over 200 cases of nephritis of varying types, approximately 350 cases of urinary obstruction, mostly prostatic cases, in 150 cases of unilateral or bilateral disease in conjunction with urethral catheterization, besides being used in over a thousand other cases as part of a routine examination. The added experience confirms entirely the early conclusions regarding the reliability and accuracy of the test.—J. Am. M. Assoc., v. 60, 191-192. (M. I. W.)

**Phenoltetrachlorphthalein.**—*Use as a Test for Hepatic Function.*—Rowntree, Hurwitz and Bloomfield say that the constant findings in health, the decreased output in liver disease, the analogy between the effect of anæmia and myocardial insufficiency on kidney and liver function as indicated by the sulphonephthalein and the tetrachlorphthalein tests, the results of the test in experimental liver lesions, and the established value of sulphonephthalein, based on the same principle as the test in kidney diseases, the authors believe, all indicate that the excretion of tetrachlorphthalein will be useful in the estimation of the functional capacity of the liver. (Bull. Johns Hopkins Hosp., v. 24, No. 273.)—J. Am. M. Assoc., 1913, v. 61, 2190. (M. I. W.)

**Pyraconitine.**—*Chemistry.* Schulze and Liebner continuing the work of the former on the alkaloids of aconite have repeated the work done by Dunstan and Carr on pyraconitine and that done by Makoshi on pyrojapaconitine. They find that figures obtained by them on pyraconitine do not agree in all respects with those published by Dunstan and Carr; that pyraconitine and pyrojapaconitine are identical substances having the formula  $C_{32}H_{41}NO_9$  with ether or alcohol of crystallization and melting at  $171^\circ C.$  when thoroughly dried, and that, as brought out by previous investigators, on heating the aconitine at  $192^\circ C.$  for about ten minutes, using a bath of dimethylaniline, it is split into pyraconitine and acetic acid. From samples of the pyraconitine prepared from aconitine and from japaconitine the same set of salts was prepared as follows: the hydrochloride (m. p.  $167^\circ C.$ ); the gold chloride double salt ( $C_{32}H_{41}NO_9HAuCl_4$ ) (m. p.  $157^\circ C.$ ); the hydrobromide (m. p.  $240^\circ-242^\circ C.$ ); and the hydriodide (m. p.  $157^\circ C.$ ); the perchlorate (m. p.  $190^\circ C.$ ).—Arch. d. Pharm., 251 (1913), No. 6, 453. (H. V. A.)

**Pyridine Derivatives.** *Methods of Formation.*—E. Schmidt and his students report on the following pyridine derivatives:

1. Pyridine, one molecule, and methylene iodide, one molecule, mixed with methyl alcohol and heated on a water bath with invert condenser for one hour gave only *dipyridinemethyleniodide* of Prescott and Baer ( $C_5H_5N)_2CH_2I_2 + H_2O$ ; melting at  $220^\circ$  with decomposition.

2. Treating this with silver chloride, *methylenedipyridyl dichloride*—( $C_5H_5N)_2CH_2Cl_2 + H_2O$ ; m. p. above  $260^\circ$ —was obtained, as well as its double salts with gold, platinum and mercury.

3. **Methylenedipyridyl Picrate**, yellow needles, m. p.  $230^\circ$ .



4. **Pyridylformocholine Methyl Ether** of Litterscheid was treated with HCl and III with the hope that such action would produce the hydrochloride of *pyridineformocholin*,  $C_5H_5N(Cl)-CH_2OH$ . This was not, however, the case, the reaction resulting in the splitting off of the  $CH_2-O-CH_3$  group, leaving only pyridine.

5. Treatment of pyridine with ethylene bromide gave *ethylenedipyridyl bromide* of Baer and Prescott— $(C_5H_5NBr)_2C_2H_4$ ; m. p.  $287^\circ$ —and treatment of this with platinum chloride gave not only the *platinum compound of ethylenedipyridyl chloride*— $(C_5H_5NCl)_2C_2H_4 + PtCl_4$ ; m. p. over  $260^\circ$ —but also *bromethylpyridyl platinum chloride*— $[C_5H_5N(Cl)C_2H_4Br]_2PtCl_4$ ; m. p.  $220^\circ-221^\circ$ , as well as the platinum compounds of a double salt of pyridine chloride and chlorethylpyridyl chloride (m. p.  $209^\circ-210^\circ$ ) which was identified by analysis of both platinum and gold compounds.

6. **Ethylenedipyridyl Chloride**,  $(C_5H_5NCl)_2C_2H_4$ , m. p. over  $260^\circ$ , platinum double salt of same (see "5"), gold double salt,  $(C_5H_5NCl)_2C_2H_4 + 2AuCl_3$ ; m. p. over  $260^\circ$ .

7. **Ethylenedipyridyl Picrate**, m. p.  $246^\circ$ .

8. **Bromethylpyridyl Bromide**,  $C_5H_5N(Br)C_2H_4Br$ , m. p.  $100^\circ-103^\circ$ ; platinum double salt of same, m. p.  $220^\circ$  (see "5"), gold double salt,  $C_5H_5N(Cl)C_2H_4Br + AuCl_3$ , m. p.  $135^\circ-136^\circ$ ; mercury double salt,  $C_5H_5N(Cl)C_2H_4Br + HgCl_2$ , m. p.  $128^\circ$ ; picrate, m. p.  $128^\circ$ .

9. **Chlorethylpyridyl Chloride**,  $C_5H_5N(Cl)C_2H_4Cl$  not yet obtained in crystals. Platinum double salt,  $[C_5H_5N(Cl)C_2H_4Cl]_2 + PtCl_4$ , m. p.  $218^\circ$ ; gold double salt,  $C_5H_5N(Cl)C_2H_4Cl + AuCl_3$ , m. p.  $135^\circ-136^\circ$ .

10. **Pyridinecholine** and its gold and platinum double salts (already described by Coppola) and a new mercury double salt— $C_5H_5N(Cl)C_2H_4OH + 6HgCl_2$ ; m. p.  $186^\circ-190^\circ$ .

11. **Pyridineurine** and its gold and platinum double salts (already described by Coppola) and that in crystals. Melting points: Gold salt,  $178^\circ$ ; platinum salt,  $193^\circ$ .

Details of manufacture and of analysis of each of the above mentioned are given in the paper.—Arch. d. Pharm., 251 (1913), No. 3, 183. (H. V. A.)

**Scopolamine.**—*Permanent Solution.*—Dr. W. Straube prevents the decomposition of scopolamine solutions, that is, the formation of tropaic acid ester of scopoline, by the addition of mannite, the very soluble sixatomic alcohol. The biologic assay of such a

preparation which was over one year old, proved the same as that of a fresh solution. —Münch. Med. Wschr., 1913, No. 41. (O. R.)

**Theobromine.**—*Influence of Purity on Its Toxicity.*—Theobromine, which is much prescribed on the European continent to stimulate the elimination of uric acid, has been found to give variable results, which have been attributed to personal idiosyncrasy. G. Dorléans, doubting this view, has found by physiological experiments with rabbits that the toxicity of different commercial specimens of theobromine varied in their lethal dose from 0.15 to 0.36 Gm. per kilo. Taking one of these with a toxicity of 0.23 Gm. per kilo and purifying it by fractional precipitation, four fractions were obtained having toxicity in this order: 0.39, 0.57, 0.34 and 0.30 Gm. per kilo. It is, therefore, evident, in the case of theobromine of French commerce, that variable results obtained must be attributed not so much to the reaction of the patient as to the unsatisfactory degree of purity of the drug.—Pharm. Journ. and Pharmacist, July 19, 1913, 73; from L'Union Pharm., 54 (1913), 256.

**Thymolphthalein.**—*Preparation and Properties.*—According to S. Kermatsu and S. Nakahashi, thymolphthalein, a new indicator for alkalimetry, is obtained by heating together for six hours at 115°–120° C., 3 parts of thymol, 2.5 parts of zinc chloride, and 3 parts of phthalic anhydride. The cold melt is then disintegrated, and the uncombined thymol is removed by means of steam. The crude product is dissolved in caustic soda, and the solution poured into dilute hydrochloric acid. The liberated thymolphthalein is precipitated; it is washed with water, and crystallized from alcohol. Thymolphthalein occurs in colorless needles, melting at 245°–246° C.; readily soluble in alcohol and in acetone; sparingly dissolved by chloroform or by ether. It dissolves in caustic alkalis with the formation of blue color; it may therefore serve as an indicator for alkalimetry, for the color is not affected by excess of alkali. In strong sulphuric acid it dissolves with production of a carmine-red color. Pharm. Zentralh., 54 (1913), 1168; from "Yakuga-kuasshi," 1913 (376), 2.

#### GLUCOSIDES AND NEUTRAL PRINCIPLES.

**Synthetic Alcohol Glucosides.**—*Additional Ones Obtained by the Biochemical Method.* Bourquelot and Bridel now record a series of experiments on the biological synthesis of alcohol glucosides, made in the course of their investigations, but not hitherto pub-

lished. These include the formation of a  $\beta$  glucoside of amylene hydrate, as representing a tertiary alcohol, and of ethylphenylglycol ether, representing a secondary alcohol. In each case, the optical deviation observed after contact of the alcohol with emulsin and glucose with a little water indicated the formation of a  $\beta$ -glucoside. In a large number of subsequent experiments, acetone containing 1 part of water in 5 parts by weight of acetone was the vehicle used. 2 Gm. of glucose were dissolved in 100 Cc. of this, forming the stock solution for the experiments. With this, optical indications were obtained of the formation of  $\beta$ -glucosides on contact with emulsin and the respective alcohol in the case of caprylic alcohol, cetyl alcohol, cyclohexanol, orthomethylcyclohexanol,  $\alpha$ -naphthyl alcohol, borneol, and morphine. With glucose and yeast glucosidase, glycerin and salicin both formed an  $\alpha$ -glucoside. Benzaldehydecyanhydrin with acetone containing 10 per cent. of water saturated with glucose also gave indications of forming a  $\beta$ -glucoside. Pharm. Journ. and Pharmacist, August 30, 1913, 349; from Journ. de Pharm. et Chim., 1913, 8, 109.

**Alpha-Propyl and Alpha-Allyl Glucosides.**—*New Synthetic Alcohol Glucosides.* H. Hérissey and M. Bridel describe the latest addition to the list of the synthetic alcohol glucosides,  $\alpha$ -propyl glucoside and  $\alpha$ -allyl glucoside, prepared by the biochemical method by the contact action of  $\alpha$ -glucosidase from dried bottom yeast on the respective alcohols and glucose. As in the case of the previously recorded  $\alpha$ -ethyl glucoside and  $\alpha$ -methyl glucoside, good yields could be obtained only when the reaction liquids did not contain more than 15 per cent. of the alcohols.  $\alpha$ -Propyl glucoside has the optical rotation  $+140.8^\circ$  and  $\alpha$ -allyl glucoside  $+132^\circ$ . Both glucosides in aqueous solution are fermented by yeast.—Pharm. Journ. and Pharmacist, June 14, 1913, 839; from Journ. de Pharm. et Chim., 1913, 503.

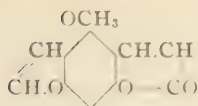
**Amygdalin.**—*Hydrolysis with Different Emulsions.* Noting Kriebel's statement that he had obtained a hydrolysis product of amygdalin, *l*-benzaldehyde cyanhydrine, while all previous investigators had obtained only the dextrogyrate modification, Rosenthaler studied this question by treating amygdalin with emulsins from various sources (see preceding abstract) and by making synthetic benzaldehyde cyanhydrine with aid of the several emulsins. He finds that while benzaldehyde and hydrocyanic acid synthesize under influence of *d*-oxynitrilase to dextrogyrate and inactive cyanhydrines, the inactive cyanhydrine thus formed

by further action of *d*-oxynitrilase will form the levogyrate cyanhydrine. To accomplish the feat, an emulsin containing *d*-oxynitrilase must be used, which is true of the emulsin from cherry stones. Such emulsin will hydrolyze an amygdalin to levogyrate cyanhydrine while the emulsin from almonds will yield the dextrogyrate variety.—Arch. d. Pharm., 251 (1913), 85. (H. V. A.)

**Atractylin.**—*A Delicate Reagent for Formaldehyde in Plants.*—F. Angelico and F. Catalano observe that it is generally accepted that traces of formaldehyde are present in the foliage leaves of plants during the period of active assimilation under the influence of sunlight. But when the same plants are kept in darkness so as to suppress the chlorophyllin function, formaldehyde is absent. Parasitic plants, such as *Psalliotia campestris* and *Coprinus*, which do not contain chlorophyll, also fail to give any indication of the presence of formaldehyde. The reagent used by the authors in their experiments was attractylin, which is a glucoside of *Atractylis gummifera*. It has been found to be the most delicate test yet devised for minute traces of formaldehyde; a solution obtained, for example, by adding 3 drops of 40 per cent. formaldehyde to 1 liter of water gives, under suitable conditions, a distinct violet coloration with the reagent. This behavior is quite specific, no other aldehyde or substance responding in the same way.—Pharm. Journ. and Pharmacist, August 9, 1913, 249; from Gaz. Chim. Ital., xlii, 1, 38.

**Bergaptene.**—*Chemical Constitution.*—H. Thoms, in collaboration with Priess, has recently shown that the xanthoxin isolated by them from the pericarps of *Fagara xanthoxyloides*, Lam. (see Year Book, 1912, 197), is isomeric with bergaptene, and that xanthoxin is a coumarin-coumarone derivative. He has now, in collaboration with Baetcke, examined bergaptene with the object of demonstrating its constitution. Bergaptene was first converted into nitrobergaptene, and from this a new aminobergaptene was prepared by reduction with tin and hydrochloric acid. By careful oxidation of aminobergaptene by means of sodium dichromate and sulphuric acid, quinone was obtained in golden yellow crystals, melting at 248°–250°, the amino group and the methoxyl group of the bergaptene being each replaced by an atom of oxygen. As the elimination of such groups is usually accompanied by the fixation of oxygen in the para position in the benzene ring, and as bergaptene is a phloroglucin derivative, it is extremely probable that bergaptene has the constitution:





If this is correct, nitroxanthotoxin must be convertible into a hitherto unknown aminoxanthotoxin, and this into the same quinone. This conversion Thoms and Baetcke have effected, thus proving bergaptene to have the constitution above indicated.—Pharm. Journ. and Pharmacist, March 15, 1913, 367; from Ber. d. D. Chem. Ges., 1912, 3705.

**Digitonin.**—*Reactions.*—According to C. Reichard digitonin is differentiated from digitoxin, as well as from other constituents of digitalis leaves, by its negative color reaction with hydrochloric acid, cobalt and iron salts. As a direct test of identity, the formation of rose-colored hexagon crystals can be taken into consideration, which are formed in an acetic acid solution of cobalt nitrate. If this crystal reaction is positive, then digitonin is present.—Ph. Zhalle., 1913, No. 9. (O. R.)

**Digitoxin.**—*Reaction.*—C. Reichard claims that digitoxin is the most important of the more active constituents in digitalis, although digitalin and digitalein are very valuable. He questions that the saponin digitonin possesses the property of aiding the solution of the above three glucosides. His numerous experiments, which are given in a voluminous paper, depend upon the use of digitoxin-purissimum Merck. Among the numerous reactions reported, he considers the following three of the greatest importance: When a small, or even minute crystal of digitoxin is treated with one drop of 25% hydrochloric acid, and is then heated, a bright green color is developed in the liquid as well as in the crystal. This reaction is best observed under the microscope. Digitonin does not give this hydrochloric acid reaction.

The second positive reaction is the red-brown coloration, produced by ferric salts.

The third important and new reaction is by means of cobalt nitrate. When a drop of this saturated solution is evaporated, and a crystal of digitoxin is added together with glacial acetic acid, the mixture becomes an intense yellowish green, which is best observed under the microscope. This reaction can be used as a special test of identity for digitoxin, as the same color is not observed with other glucosides. Ph. Zhalle., 1913, No. 28. (O. R.)

**Emodin.**—*Assay Process.*—George E. E'we and Charles Vanderkleed recommend the following: Sample equivalent to 0.2 Gm. emodin, calculating size of sample from standard of drugs and preparation. Place into 100 Cc. of 2 per cent. alcoholic KOH contained in a flask on sand (100 Gm.). Boil under reflux one hour, allow to cool one-half hour, pour off liquid through cotton into cylinder. Repeat extraction three times, evaporate in dish on water bath until nearly dry. Dissolve residue in 5 Cc. water, transfer to separator, making final volume 25 Cc. Add 60 Cc. of ether, then ten per cent.  $\text{H}_2\text{SO}_4$ , 5 Cc. at a time, until acid to litmus, then add 2 Cc. more, shake for three minutes, allowing to separate. Draw off aqueous layer to a second separator, pour ether through cotton into a 400 Cc. beaker. Repeat the extraction with 60 Cc. ether three times, reject aqueous layer, evaporate the ether extractions on water bath to small volume. Add 20 Cc. stronger ammonia water, heat on steam bath until nearly dry, add 10 Cc. water warm, add 10 Cc. ten per cent.  $\text{H}_2\text{SO}_4$ , warm fifteen minutes with almost constant stirring, cool for fifteen minutes, filter on small filter into a separator. Wash beaker and filter with water until total volume is 35 Cc. Place the filter paper into the beaker used in heating treatment with sulphuric acid, add 15 Cc. 5% sulphuric acid, heat on steam bath with almost constant stirring for fifteen minutes. Cool for fifteen minutes, filter on small filter into the separator containing the first filtrate, wash the beaker and filter with water until free from acid. Total volume of both filtrates must be 70 Cc. Shake out with four portions of 60 Cc. ether each, evaporate in tared flask, dry at not more than  $60^\circ\text{C}$ . for two hours and then in desiccator to constant weight.—Proc. Penn. Phar. Assn., 1913, 325. (E. C. M.)

**Gentiacaulin.**—*A New Gentian Glucoside.*—Bridel has isolated and describes a new gentian glucoside from *Gentiana acaulis*, a plant which is familiar in Europe in alpine rock gardens, where it is much esteemed on account of its very handsome blue flowers. It was obtained from an alcoholic extract from the whole flowering plant on treatment by the biochemical method of Bourquelot, forming fine golden yellow micro needles united in bundles, with a sweetish taste, which separate in the anhydrous condition from 90 to 95 per cent. alcohol. It has no definite melting point, frits at  $145^\circ$ , and decomposes between  $155^\circ$  to  $160^\circ$ . It is levorotatory,  $-63^\circ 84'$ ; readily soluble in water, and readily hydrolyzed by dilute sulfuric acid, forming *Gentiacaulin*, a bright yellow crystalline substance with phenolic characters; insoluble in water, soluble in dilute alkalies, and crystal-

lizing from alcohol in anhydrous needles grouped in bundles. It melts at  $177^{\circ}$  to a brownish liquid, which crystallizes on cooling. The sugar formed by the hydrolysis has been identified as *xylose*. Gentiacaulin is not hydrolyzed by emulsin. The crude glucoside has the formula  $C_{47}H_{60}O_9$ .—Pharm. Journ. and Pharmacist; from Journ. de Pharm. et Chim., 1913, 8, 24.

**Gentiopicroin.**—*Presence in the Leafy Stems of Certain Gentians.*—Bridel finds that the leaf-bearing stems of *Gentiana lutea*, of *G. asclepiadea* and of *G. cruciata* all contain gentiopicroin. In the two former as much as 0.3 to 0.4 per cent. has been found, but *G. cruciata* stems contain only a little. In this respect it resembles the leafy stems of *G. pneumonanthe*, which has been reported on previously. The leaf-bearing portions of *Chlora perfoliata* and of *Swertia perennis* were also found, some years ago, to contain gentiopicroin.—Pharm. Journ. and Pharmacist, June 14, 1913, 839; from Journ. de Pharm. et Chim., 1913, 7, 486.

**$\beta$ -Geranyl Glucoside.**—*Preparation by the Biochemical Method.*—Bourquelot and Bridel have now published the details of the interesting synthesis of  $\beta$ -geranyl glucoside by means of emulsin, which was announced by them some months ago. Indications had previously been obtained that geraniol must be present in plant tissues as a glucosidal compound. This is now proved to be so in the case of fresh *Pelargonium odoratissimum* leaves. The glucoside has been isolated and hydrolyzed by emulsin, yielding geraniol. No indication of the presence of the glucoside could be obtained from a sample of dried, very fragrant *Andropogon nardus* examined. In this instance the glucoside originally present had doubtless been destroyed by the process of drying.—Pharm. Journ. and Pharmacist, October 4, 1913, 497; from Journ. de Pharm. et Chim., 1913, 8, 204.

**Gitonin.**—*A New Digitalis Glycoside.*—A. Windhaus and Schneckenburger have isolated a new digitalis glucoside from Merck's digitonin, to which they have given the name "gitonin" and assign the formula  $C_{49}H_{80}O_{23}$ . Gitonin is levorotatory, crystallizes in white leaflets and melts at  $271^{\circ}$ – $272^{\circ}$ . It is readily soluble in chloroform and in hot alcohol. Pharm. Ztg., lviii (1913), No. 84, 839; from Ber. d. D. Chem. Ges., 1913, 46.

**Helleborein.**—*Chemical and Physiological Relations.*—E. Sieburg has investigated this glucoside from *Veratrum album*, both chemically and physiologically. He confirms Thaeter's state-

ment that it hydrolyzes to helleboretin, carbohydrate and acetic acid and agrees with Kobert, that it constitutes the bridge between the true saponins and the digitalis bodies. Working with commercial helleborein, he finds that it neither crystallizes nor dialyzes, so concludes it is amorphous; that it turns brown without fusion; that its aqueous solution shows the polariscopic index  $\alpha_D^{22} = -2.8^\circ$ ; while combustions show that its composition is  $(C_{21}H_{34}O_{10})_3$ , agreeing with Kobert's general formula for saponins,  $C_nH_{2n-8}O_{10}$ . From this helleborein, Sieburg prepared *acetylhelleborein*,  $3C_{19}H_{26}O_8(OC(=O)CH_3)(CH_3CO)_5$ , m. p.  $129^\circ-130^\circ$ , the molecular weight (1969) being proven by the Beckmann freezing process. From this acetyl compound, helleborein was regenerated by saponification. *Benzoylhelleborein*,  $3C_{19}H_{26}O_8(OC(=O)CH_3)(C_6H_5CO)_5$ , the molecular weight of which (2899) was confirmed by Beckmann's process. These two compounds show that the helleborein molecule  $-(C_{21}H_{34}O_{10})_3-$  contains 15 hydroxyl groups. Treatment of helleborein with alkali caused a splitting off of the acetyl group that the body naturally contains, while bromination likewise caused a similar separation of acetic acid, the residue being free from bromine and resembling the original helleborein save that on hydrolysis the two sugars and sapogenin were produced and no acetic acid. The hydrolysis products of helleborein were carefully studied and were found to consist of acetic acid, a sugar mixture ( $\alpha_D = 42^\circ$  to  $45^\circ$ ) and a sapogenin mixture. The sugar mixture was found to consist of glucose and arabinose, while from the sapogenin mixture, two bodies were isolated: one which he called acid helleboretin,  $C_{21}H_{36}O_7$ , melting while turning brown at  $110^\circ$ , while the other, neutral helleboretin melting at over  $200^\circ$ , seems to have the formula  $C_{15}H_{24}O_3$ , and therefore belongs to Kobert's oxysapogenol group. The former fused with potassium hydroxide, gives protocatechuic acid, while distilled with zinc dust under 40 Mm. pressure, gives a light yellow fraction at  $210^\circ$  and a thick brown one at  $260^\circ$ . Analysis of both of these suggests the formula  $C_{10}H_{16}O$ . The neutral helleboretin fused with potassa gave oxalic acid and when distilled with zinc dust under 50 Mm. pressure gave between  $220^\circ$  and  $270^\circ$ , a yellow-brown fluorescent liquid, which showed on analysis the formula  $(C_5H_8)_x$ . These zinc-dust distillation products would indicate that helleboretin is a terpene derivative, even as is the case with other sapogenins. The paper closes with a report on the pharmacology of helleborein which shows that its action is more akin to the saponins than to the digitalis bodies. It is also interesting that when acetylated or brominated it no longer



has toxic action. Arch. d. Pharm., 251 (1913), Nos. 2 and 3, 154 and 161. (H. V. A.)

**Rhein of Commerce.** *Not True Rhein.* Oesterle and Haugseth have examined three available commercial samples of "rhein cryst." and find that each sample consists solely of pure crysophanic acid melting at  $196^{\circ}$  C. Commercial "rhein" is, therefore, not true rhein or dioxyanthraquinone carbonic acid and the name "rhein" should not be applied to it. —Arch. d. Pharm., 251 (1913), No. 7, 550. (H. V. A.)

**Salicin.** *Attempted Synthesis by the Biochemical Method.* Although Bourquelot and Hérissé have not yet succeeded in the synthesis of salicin by means of the biochemical method, the results, of which a preliminary outline was given by the former, in the course of a discussion at the first May meeting, 1913, of the Société de Pharmacie, are of considerable interest. When saligenin and glucose in hydrated acetone are left in contact with emulsin, synthetic action does occur. Although the glucoside formed regenerates saligenin when hydrolyzed, it is not salicin. As far as can be determined at the present stage of the investigation, it is an isomer of that substance, in all probability  $\beta$ -salicyl glucoside formed from the saligenin in its alcoholic function.—Pharm. Journ. and Pharmacist, July 5, 1913, 11; from Journ. de Pharm. et Chim., 1913, 7, 503.

**$\beta$ -Salicyl Glucoside.**—*Synthesis by the Biochemical Method.* By allowing emulsin to act upon glucose and saligenin in presence of a medium composed of pure acetone with a small amount of water. B. E. Bourquelot and H. Hérissé have obtained a compound which proves to be  $\beta$ -salicyl glucoside. It forms acicular crystals, which in tranquil crystallization may attain the length of one centimeter. It is odorless and has a bitter taste, and is fairly soluble in water. The melting point varies under the conditions of heating. When gradually warmed it begins to soften and agglomerate at  $50^{\circ}$ – $60^{\circ}$  C., then melts to a glassy, viscous mass, which loses weight slightly. Even after being kept for some hours at  $120^{\circ}$  C. it recrystallizes on adding a few drops of water. Apparently it contains four molecules of water of crystallization. Its  $\alpha_D$  is  $-37^{\circ} 5'$ . The glucoside reduces alkaline cupric tartrate reagent; its reducing equivalent is one third that of glucose. The aqueous solution is rapidly hydrolyzed by emulsin into saligenin and glucose. With ferric chloride it gives a bright but not very

deep violet agitation with ether.—Pharm. Journ. and Pharmacist, June 28, 1913, 905; from Compt. rend., 156 (1913), 1790.

**Santonin.**—*Physiological Action of Some Derivatives.*—E. Sieburg records some observations on the physiological action of certain santonin derivatives. He says that santonin is known to be a lactone of santonic acid, which is an unsaturated derivative of hexahydro-dimethyl-naphthalene of ketone character, containing a propionyl group. It is chiefly employed as a vermifuge on account of its action on ascarides, which it drives from the small intestine to the large, whence they can be evacuated. Its use is not without disadvantages and some danger, due to its strong toxic properties, against which may be set the fact that it is not easily absorbed. It appeared likely that derivatives of santonin in which the molecular structure was not much altered might be equally useful and less toxic. The addition of hydrogen to the molecule by the catalytic action of finely divided palladium produced two stereoisomeric tetrahydro derivatives,  $C_{15}H_{22}O_3$ , to which the names  $\alpha$ - and  $\beta$ -santonan were given; these retain the ketone and lactone groups, and only the ethylene linkage has disappeared. Experiments on frogs, guinea pigs, etc., showed them to be free from toxicity; but when they were also tested on ascarides they showed no action whatever upon them, and it is thus shown that they cannot take the place of santonin as a vermifuge.—Pharm. Journ. and Pharmacist, November 29, 1913, 809; from Chem. Ztg., August 7, 1913, 945.

**Saponins.**—*Chemical Structure.*—Continuing his work on saponins (Journ. A. Ph. A., 1912), van der Haar reports on five more. *Guaiac saponin* hydrolyzed with 5% sulphuric acid gives about 48% sapogenin. This distilled with zinc dust in a stream of hydrogen gave a green fluorescent liquid of terpene-like odor, which on steam distillation gave a light yellow oil without fluorescence (10%) and an odorless brown sticky residue (40%). The oil gave a crystalline bromine product and was presumably a mixture of terpenes. The residue gave the cholesterol reactions.

**Levant Soap Root Saponin.**—The sapogenin derived from this saponin when distilled as above gave 34% of a yellow oily mass which steam distillation separated into a terpene-like non-fluorescing oil and an odorless yellow-brown mass. The oil gave a bromine addition product, while the mass responded to the cholesterol reactions.

**Levant Soap Root Sapotoxin, Senegin and Digitonin** likewise gave by distillation, as above, fluorescent oils which steam distillation separated into terpene-like volatile oils and less volatile cholestrol products. The paper gives approximate yield of each and whenever enough of the product was available, combustion analyses were made, not, however, with very satisfactory results. Each volatile oil on standing becomes darker and less fluid, hence the lower the temperature of preparation, the better yield of the terpene body. The conclusions are that all five saponins have structures similar to  $\alpha$ -hederagenin (previously reported by the author), that the terpene-like bodies obtained from each have the same percentage composition and that future work on saponin is apt to lead into terpene chemistry. *Arch d. Pharm.*, 251, No. 3, 217. (H. V. A.)

**Saponin.**—*Use in Beverages.* Dr. Jos. Halberkann has made numerous researches and has reached the following conclusions: Glycyrrhizin is not a suitable medium to produce foam, as it requires an alkaline solution, while most beverages and all lemonades are distinctly acid. Saponins are soluble in acidulated water, but have the disadvantage of being mostly poisonous. However, the poisonous properties of saponins can be removed and the harmless saponins can easily be distinguished from the poisonous ones owing to their negative hemolysis. The use of poisonous saponins in beverages is legally prohibited, but that of harmless ones is permissible. *Mineralw. Fabrikant. Ztg.*, 1912, No. 25-30. (O. R.)

**Saponin.**—*Use in Chemical Analysis.*—It is well known that in quantitative analysis it is frequently difficult to remove the last traces of a very fine precipitate from the vessel on to the filter. C. Bunge recommends for this purpose the use of one or two drops of an aqueous solution of saponin. On account of its foaming qualities, even in very high dilutions, saponin is used in the manufacture of numerous beverages. Bunge recommends the addition of 1 or 2 drops of a solution of saponin in water to be added to the rinsing water. Upon shaking, a copious foam is produced, to which the fine particles of the precipitate will cling and can therefore be transferred easily from the vessel to the filter. *Ph. Zhalle.*, 1913, No. 25. (O. R.)

**Crystallized Kombe Strophanthin.**—*Chemical, Physical and Physiological Properties.*—In a comprehensive essay running through several numbers of the *Journal of the American Pharmaceutical*

Association, D. H. Brauns and O. E. Clossen observe that the chemistry of *Kombé strophanthus* seed and in particular that of strophanthin is in an uncertain state, due possibly to the fact that the strophanthin under examination was prepared from seeds other than the *Kombé* species, but generally to other causes, as the authors propose to show. Commercial strophanthins vary considerably in their chemical reaction as well as in their physiological activity. To clear up these uncertainties and to determine whether a strophanthin of constant chemical, physical and physiological properties can be prepared, is the object of the experiments described in this paper. It includes also a summary of the most interesting work done on strophanthin and the methods for its preparation used by the different investigators with an account of the origin and characteristics of the seed used. A complete list of the chemical literature on *Kombé strophanthin* (including *gratus strophanthin* or *ouabain* and *hispidus strophanthin*) is given at the end of the communication. It is impracticable, of course, to enter into the details of this comprehensive research, and it must, therefore suffice to here reproduce *verbatim* the authors'

#### RÉSUMÉ.

"The seeds of *Strophanthus Kombé*, Oliv., contain two strophanthins: a crystalline glucoside of the formula  $C_{40}H_{56}O_{15} + 3H_2O$  and a closely related amorphous strophanthin of apparently twice the molecular weight. By the action of water on crystalline *Kombé strophanthin* there is formed a monobasic acid strophanthin or a mixture, *c. g.*, of a monobasic acid, a dibasic acid and the original crystalline strophanthin. These three strophanthins, crystalline, its acid derivative and amorphous *Kombé strophanthin*, when split by dilute acids give strophanthidin of the formula  $C_{27}H_{38}O_7 + H_2O$ . This strophanthidin is identical with the strophanthidin described by Feist and by Heffter and Sachs.

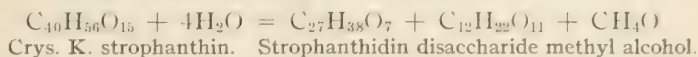
"Crystalline *Kombé strophanthin* contains neither a pentose nor a methyl pentose (rhamnose). Amorphous *Kombé strophanthin* apparently contains a pentose. The crystalline *Kombé strophanthin* prepared by Arnaud is doubtless identical with that prepared by us, but Arnaud was at fault in considering as a hydrate, a new chemical derivative, which we have spoken of as amorphous acid strophanthin.

"The results of Kohn and Kulisch show a marked conformity with those of Arnaud and of our own upon amorphous acid strophanthin in everything except the data upon strophanthidin.



It seems probable that the method of cleavage and purification accounts for the different strophanthidin.

"Crystalline Kombé strophanthin apparently undergoes the following cleavage when heated with dilute acids:



"Notwithstanding the uncertainty as to the purity of amorphous substances we have shown that a strophanthin different from crystalline Kombé strophanthin is present in identified Kombé seed. Heffter and Sachs have shown that identified hispidus seeds do not contain a crystalline strophanthin, but an amorphous one which is identical or closely related to the amorphous strophanthin from Kombé.

"Both crystalline Kombé strophanthin and amorphous acid strophanthin show the typical heart tonic response, diminished rate and increased amplitude of the heart beat, accompanied by a small rise in blood pressure.

"The activity of the amorphous acid strophanthin is less than that of the crystalline strophanthin. By the frog method of Houghton, the activity of these strophanthins is in the ratio one to three.

"It is very interesting to note that this loss of activity is associated with the loss of one lacton group.

"We believe this crystalline Kombé strophanthin as the definite active constituent contained in *Strophanthus Kombé Seed*, U. S. P., should be adopted as the standard by which the value of the various preparations of the drug should be measured."—Journ. A. Ph. A., May (604-618), June (715-734), and July (813-853), 1913.

**Vanillin.** *Adulteration with Acetanilide.*—A Jönsson noticed that a sample of vanillin, which was offered at a very low price, had a melting point of about 65° instead of 81° to 82°, the usual melting point of the commercial article. It was entirely soluble in ether, but only partially in caustic soda; by shaking out the caustic soda solution with ether, therefore, the adulterant was obtained by itself, and found to constitute nearly 50 per cent. of the material. The substance so extracted was proved to be acetanilide by its melting point after recrystallizing (114°), by the isonitrile test, and by bromination, which gave brom-acetanilide of melting point 166°-167°. Pharm. Journ. and Pharmacist, June 21, 1913, 875; from Svensk. Farm. Tidskr., 1913, 9.

**Vanillin.**—E. O. von Lippmann has isolated vanillin from

*Gymnadenia albida*, Rich., growing near Davos in French Switzerland. He extracted the cut flowers with alcohol and ether, which solution he clarified with lead acetate. Upon evaporation an ointment-like substance remained, from which vanillin (melting point  $82^{\circ}$  C.) was isolated.—Pharm. Ztg., 1913, No. 39. (O. R.)

#### COLORING MATTERS.

**Coloring Matters.**—*Method of Examination.*—The usual method of examining coloring matters consists in the use of two strips of filter paper, one moistened with distilled water, and the other with alcohol, suspended vertically, and a little of the powdered coloring material blown on to each. If the color is a simple one, the tint obtained on the paper is uniform; if a mixture, each particle of colorant appears with its own color, according to whether it is soluble in alcohol or water. The following modification of the method is proposed by Frenkel: A piece of filter paper, 5 Cm. square, is sprinkled with a very small quantity of the colorant; while the paper is held horizontally a small drop of distilled water is allowed to fall on to the paper, and by its side a drop of alcohol. In spreading out on the paper, the drops produce regular spots in which are distinguished clearly the colorants which constitute the mixture. On the back of the spot produced by the solvent after the paper has been dried, the tints of the soluble components are observed very distinctly.—Pharm. Journ. and Pharmacist, April 5, 1913, 469; from Ann. Chim. Analyt., February 15, 1913, 58.

**Red Anthocyan.**—*Production from a Coloring Substance in Green Leaves.*—The autumnal change in color of leaves from green to brown or red has long attracted the attention of biologists. Numerous chemical theories have been put forward to elucidate the nature of this change, but have not proved satisfactory. It has generally been assumed that the alteration in color is the result of oxidation. The experimental results now obtained by R. Combes, however, show that it is, on the contrary, due to reduction. He has extracted from the green leaves of Virginian creeper, *Ampelopsis hederacea*, a yellowish brown crystalline substance, which gives a purple-red anthocyan when its solution in alcohol, 90 per cent., acidified with hydrochloric acid, is treated with nascent hydrogen. The purple coloring matter thus gradually formed has been obtained in a crystalline condition. It is identical in crystalline form and in melting point and in chemical reactions with the purple anthocyan isolated from the red autumnal leaves of the same plant. The experimental production of the red anthocyan from the brown

coloring matter of leaves in the green state has, therefore, been realized; and the demonstration that it is the result of reduction, and not of oxidation, will probably elucidate the cause of the change of color of leaves in autumn. Pharm. Journ. and Pharmacist, December 27, 1913, 949; from Compt. rend., 157 (1913), 1002.

**Dyes.**—*Absorption by Colloidal Clay.*—According to P. Rohland there appears to be some connection between the constitution of dyestuffs and the ease with which they are absorbed by colloidal clay. For the complete absorption of 0.003 Gm. of dyestuff 5 Gm. of clay is required in the case of aniline blue, Victoria blue, violet, and diamond green; 10 Gm. in the case of orange and vesuvin, and 30 Gm. in the case of metanil yellow. Dyestuffs derived from azo and diazo compounds are absorbed only to a slight extent.—Pharm. Journ. and Pharmacist, September 13, 1913, 397; from Kolloid Ztschr., 13 (1913), 62; through Journ. Soc. Chem. Ind., August 15, 1913, 792.

**Coal-Tar Dyes.**—*The Quantitative Separation of Their Mixtures.*—W. E. Mathewson states that it is possible to separate certain coal-tar dyes, by means of the distribution ratio between hydrochloric acid of different concentration, and certain immiscible solvents.

A table is given, showing the per cent. of dye remaining in water solution under different concentrations of acid, after extracting with amyl alcohol, dichlorhydrin, amyl acetate, and ether.—Journal Ind. and Eng. Chem., Jan., 1913, Vol. 5, 26. (L. A. B.)

**Aniline Dyes.**—*Action on Bacteria.*—L. G. Kriegler has studied the action of some of the aniline colors on certain microbes—*Bacterium typhosus*, *B. coli*, *B. pyocyaneus*, etc. and has observed that, on the whole, the dyes are bactericidal in a higher degree even than phenol. Of the various microbes examined, *B. typhus* appears to be the least resistant. Further, the author has observed that not only is there a difference in bactericidal power between one color and another for the same microbe, differences which can readily be explained by the chemical constitution, but that one and the same color does not possess an equally strong action on all bacteria; thus one color may be a very good antiseptic with reference to a specific microbe, without being active towards another species.—Pharm. Journ. and Pharmacist, April 5, 1913, 469; from La Nature, February 1, 1913.

**Gram Staining.** —*Simple Method.*—Th. Hausmann observes that the water-soluble aniline gentian violet, which is ordinarily used for gram-staining, has the disadvantage of instability and that Klausner has, therefore, recommended a special manufacture of this coloring matter, which is supplied only by Grübner, but is stable. The author finds, however, that a 1% aqueous solution of ordinary commercial gentian violet gives the same results if the manipulation is carried out as follows: A piece of filter paper, slightly larger than the cover glass, is placed upon the microscopic slide and the solution poured upon it. The filter will retain all precipitates and the staining is ended in the usual time, and quite satisfactorily.—Pharm. Ztg., lviii (1913), No. 49, 484; from Berl. klin. Wschr., 1913, No. 22.

**Malachite Green.**—*Question of Toxicity.*—Malachite green has been used as a confectionary coloring and is stated by a number of authors to be non-poisonous. On the other hand Penzoldt says: One hundred Mgm. per kilogram body-weight of rabbit, or 70 grains per 100 pounds, injected subcutaneously, caused after the third day motor paralysis and occasional cramps, which resulted fatally at the end of the ninth day.

According to Lewin: In the case of one workman, in contrast with others who had long been unaffected by this substance, itching, burning, inflammation and swelling of hands and feet, and formation of blisters occurred.—J. Am. M. Assoc., 1913, v. 61, 2314. (M. I. W.)

**Methylene Blue.** *Unsuitability as a Coloring for Corrosive Sublimate Solutions.*—Thomas Wilson finds that when a strong solution of mercuric chloride (1 dr. in 6 oz. of water, with 1 Gm. of methylene blue) is made, the two salts being dissolved separately and mixed, an abundant, flocculent, violet-colored precipitate forms immediately, and on standing the precipitate settles to the bottom of the bottle, leaving a colorless solution on top. Even if the bottle is well shaken and the required dilution made (1 : 1000) this precipitate does not wholly dissolve. If, on the other hand, a solution of  $\text{HgCl}_2$  1 : 1000 is made, and the methylene blue dissolved in it, there is no apparent change, for some days at least, and the solution remains bright. Another uncertainty is the variation of the methylene blue on the market. Experiments made with different blue coloring matters, however, show that with the so-called "night blue" and "patent blue A," trade names given to designate two dyes, both derivatives of "triphenyl-



methane," solutions were obtained in the proportions mentioned which were absolutely clear and permanent.

"**Night Blue**" is so called on account of the fact that it is a "perfect" blue, both in artificial as well as natural light. This dye comes into the market as a chloride or phosphate, and is soluble both in water and in alcohol.

"**Patent Blue**" is the calcium salt of a sulphonic acid and possesses, with the "night blue," the advantage of costing only half as much as "methylene blue;" and though the latter, as well as "methyl violet," are frequently recommended as coloring agents for corrosive sublimate solutions, it is advisable, in view of their incompatibility with strong solutions of the mercuric salt, and their uncertain action in weaker solutions, that one or the other of the two triphenyl methane derivatives mentioned be prescribed as substitutes for the methylene dyes.--Pharm. Journ. and Pharmacist, January 25, 1913, 99-100.

**Silver-Methylene Blue**, an intensely blue powder, readily soluble in water, containing 24 per cent. of silver in colloidal form, has been found by Dr. A. Edelmann and Dr. A. von Müller-Deham to possess remarkable bactericidal properties. They find it to be effective in dilutions of 1 : 160,000 in their action upon the ordinary suppuratives, such as staphylococci and streptococci, upon *Bacterium coli* and on putrefactive bacteria, while in blood, in which many of the antiseptics fail, dilutions of 1 : 30,000 have a pronounced sterilizing effect and even dilutions of 1 : 80,000 have a strong retarding effect on bacterial development.--Pharm. Ztg., lviii (1913), No. 97, 973; from D. Med. Wschr., 1913, No. 47.

**Ancient Tyrian Purple.**—*Synthetic Production.*—Although first of all indigo, and then modern dyes have quite displaced the famous Tyrian purple from its former position of popular esteem and commercial importance, yet it has always excited interest among chemists on account of its classical fame. Also the well-known but curious source, from the glands of the marine shellfish, *Murex brandaris* and *M. trunculus*, has directed the attention of naturalists to the pigment. Various theories have been advanced to account for its formation by a process of oxidation of the juices of certain glands of these molluscs. P. Friedlaender, struck by the analogies which appeared to exist between the characters of this pigment and of thio-indigo, has investigated the substance and has succeeded in isolating the coloring matter as a definite chemical

compound in a crystalline condition. This proved to have the empirical formula  $C_{16}H_4Br_2N_2O_2$ , and its structure is shown to be that of 6,6-dibromo-indigo. This body, prepared synthetically, starting from the oxidation of acetylparabromoorthotoluidine, agrees in all its characters and reactions with the crystalline coloring principle obtained from the *Murex*. The occurrence of a bromo-organic compound in the animal organism is of considerable interest from a biological point of view. The nature of the fresh unoxidized substance in the gland, and the function of the gland and its secretion in the animal's economy, would repay investigation.—Pharm. Journ. and Pharmacist, August 2, 1913, 217; from Journ. de Pharm et. Chim., 1913, 8, 33.

**Coloring Matter of Lemon Peel.**—*Properties and Economic Uses.*—Wm. S. White, after extracting practically all the color from some fresh lemon peel, added some lime water to the mixture. Almost immediately the solution was colored a brilliant yellow color. The peels, which were very brittle and almost white when taken from the alcohol, had also changed to a yellow color. Ammonia, sodium hydroxide, potassium hydroxide, potassium carbonate and other alkalis all gave the same result. The addition of acids to the alkaline solution or to the alcoholic tincture completely destroyed all color, but the addition of an excess of alkali restored it again.

Some of this coloring principle was obtained by evaporating an ammoniacal solution of this yellow color on a water bath. It was a brownish resinous substance, insoluble in alcohol, ether, or chloroform, but completely soluble in water or in dilute alcohol. The dried peel also yields its color to alkalis, but the color is a browner shade. Boiling the solution had no effect on the color. By taking advantage of this fact these rejected lemon peels can be used very profitably as a coloring for aqueous, alkaline and hydro-alcoholic solutions.—Journ. A. Ph. A., August, 1913, 939-940.

**Likopin.**—*Coloring Substance of Tomatoes.*—Likopin is the crystallizable coloring substance in tomatoes, besides carotin and erythrophyll. Likopin is soluble in absolute alcohol, ether, xylol and carbon disulphide. It colors fats and oils yellow. Likopin is isomeric with carotin.—Berl. klin. Wschr., 1912, 1823. (O. R.)

**Tecomin.** *Identity with Lapachol.*—Under the name of "tecomin," Lee described a dyestuff from Ipe-wood, a product

of a Brazilian plant, *Tecoma chrysotricha*. This dye he reported to be identical with chrysophanic acid, but O. A. Oesterle now finds that this is not so, the dye being nothing else but lapachol,  $C_{15}H_{14}O_3$ . The paper contains combustion figures and report on the physical characters of the substance. —Arch. d. Pharm., 251 (1913), No. 4, 301. (H. V. A.)

## ALBUMINOIDS.

(Including Animal Products.)

**Albumen.**—*Improved Method of Determination in Urine.*—Dr. E. Pfeiffer, after a critical investigation of the methods of Esbach, Aufrecht, Walbaum, Tsuchiya, Brandberg and Claudius, finds only the methods of Claudius and a modification of that of Tsuchiya to yield reliable results in the determination of albumen in urine. In his modification of Tsuchiya's method the author uses as precipitant for the albumen a solution of 1.0 Gm. of phosphotungstic acid and 5.0 Gm. of concentrated hydrochloric acid in 100.0 Gm. of alcohol, and makes the determination in graduated cylindrical tubes, 14.5 Cm. high and 2.0 Cm. diameter, the process being carried out as follows: A preliminary test is made by boiling a portion of the urine in a test-tube, to approximately ascertain the quantity of albumen. If this is very large, it becomes necessary to dilute the urine with from 1 to 3 times its volume of water. The urine, or its dilution, is filled up to the mark 10 Cc. into two of the graduated tubes, and the reagent is then added to the mark 20 Cc., the admixture being effected by inverting and again raising the tubes ten times. The tubes are then allowed to stand for 48 hours at the room temperature, which should not exceed  $15^{\circ}$  R. nor fall below  $12^{\circ}$  R. The content of albumen is then calculated from the height of the albumen layer in the tubes, in accordance with a table which is given in the original paper. The experiment is made in duplicate for the purpose of control. —Pharm. Ztg., lviii (1913), No. 40, 398; from Berl. klin. Wschr., 1913, No. 15.

**Albumin.**—*Determination in Sputum.* A. Prorok agitates the sputum with equal part of 3% acetic acid, filters, and then tests the filtrate for albumin, for instance, with a solution of potassium ferrocyanide. Münch. Med. Wschr., 1912, 2413. (O. R.)

**Albumin Xanthogenates.**—*A New Class of Organic Sulphur Compounds and Their Compounds with Metals.*—R. Uhl observes that when albuminoids, such as peptone, casein, and serin, in alka-

line solution are treated with carbon bisulphide, sulphur compounds are formed, slowly in the cold, more rapidly on heating. These compounds have been named albumin xanthogenates. They are precipitated from aqueous solution in a gelatinous form by a mixture of alcohol and acetone. The dried compounds redissolve in water, giving faintly alkaline solutions. With metallic salts in suitable solutions these albumin xanthogenates form compounds containing a large amount of the metal in a state of intimate combination. These metal-sulphur-albumins are soluble in water, giving neutral solutions. The copper sulphur peptone, for instance, is obtained by treating peptone xanthogenate solution with ammoniacal copper acetate, and precipitating the brown copper compound by means of acetone. It contains 20.5 per cent. of copper. The silver and mercury compounds are prepared in a similar manner. Silver-sulphur-peptone contains 41.37 per cent. of the metal, and the mercury compound 38 per cent. of mercury. The original peptone xanthogenate is relatively but feebly toxic, either when administered by hypodermic or intravenous injection. The copper compound is neither caustic nor relatively toxic. Animals can tolerate five times more copper administered in this than in the ordinary form. Copper-sulphur-peptone has no action on the anthrax bacillus nor on trypanosomes; but it has a marked germicidal action on staphylococci.—Pharm. Journ. and Pharmacist, October 11, 1913, 533; from Ztschr. physiolog. Chem., 84 (1913), 478.

**Albumen-Milk.**—*Simple Method of Preparation.*—The following new method for preparing albumen-milk is recommended by H. Kern and E. Müller: One liter of ordinary buttermilk in 1 liter of water, boiled a short time with stirring, readjusted with water to 2 liters and then set aside so that the casein may quickly subside. After about 30 minutes, the casein will have subsided sufficiently to permit the removal of 1125 Gm. of the clear whey, which is replaced by 125 Gm. of boiled cream to restore the normal fat content of the milk. A liter of albumen-milk is thus obtained, to which sugar may be added to adjust its content to 3.5 or 7 per cent. as may be required. Under circumstances also, the amount of cream may be varied in accordance with its fat content, which should be 20 per cent. Pharm. Ztg., lviii (1913), No. 99, 990; from Berl. klin. Wschr., 1913, No. 18.

**Milk.**—*Detection of Hydrogen Peroxide.* According to E. Philippe, 10 Cc. of milk with 3 drops of a solution of vanadic acid,



containing 1 Gm. in 100 Gm. of diluted sulphuric acid, together with 0.5 Cc. of diluted sulphuric acid, immediately assume a red color in the presence of hydrogen peroxide.—Chem. Ztg. Rep., 1913, 51-53, 243. (O. R.)

**Milk.**—*Detection of Potassium Dichromate.*—B. Grewing recommends the following method for the detection of potassium dichromate in milk: To 10 Cc. of the milk, in a test tube, 4 Cc. of a 30% aqueous solution of amido benzol (aniline pur.) is added, the milk and reagent are well mixed, and about 3 Cc. of chemically pure sulphuric acid is then carefully allowed to flow along the wall of the test tube, holding it in a slanting position. At the point of contact of the acid and milk a distinct blue zone, with a violet sub-zone, will form in the course of  $\frac{1}{2}$  to 2 minutes, this depending on the quantity of dichromate present in the milk.—Pharm. Ztg., lviii (1913), No. 84, 840; from Ztschr. f. Unters. d. Nahr. u. Genussm., 26 (1913), No. 6.

**Kefyr and Yoghurt.**—Dr. W. Freund, in a lengthy paper reports on the history, properties, manufacture and uses of these sour-milk preparations, which have become popular of late.—Apoth. Ztg., 1912, No. 101. (O. R.)

**"Taette."**—*An Ancient Scandinavian Milk-Food.*—In a pamphlet issued by the dairy farm of C. Bolle, the purveyor of milk and milk products to Greater Berlin, attention is directed to a Scandinavian sour-milk product, which, under the name of "Taette," has been used from time immemorial in the Scandinavian states as a sanitary milk food. It is prepared from first-class full milk with Finnen cultures of the pure ferment and under the control of a chemist in charge of its preparation. This adds to the milk preparations, *kefyr* and *yoghurt*, both of which have enjoyed popular use in recent years, a third one, "*taette*," which is distinct from the other two, but is characterized by an equally agreeable and refreshing taste, a peculiar aroma, and efficient action. The following comparative exhibit of the three products is, therefore, interesting:

Kefyr.	Yoghurt.	"Taette."
1. From the Caucasus	From Bulgaria	From Scandinavia
2. Effervescent fluid	Consistent milk-food	Capable of being drawn out into threads
3. Mesentary-like fungi, yeasts and bacteria.	Fluid bacteria cultures	Yeasts, bacteria and oidium
4. Product of alcoholic and simultaneous lactic acid fermentation	Product of a pure lactic acid fermentation	Product of alcoholic and simultaneous lactic acid fermentation

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| 5. Recommended for pulmonary affections, anæmia, debility, and as a fattening nutrient | For stomach and intestinal ailments, kidney and biliary affections, cecitis and metabolism | In debility and intestinal affections of all kinds and as a pronounced nutrient and tonic |
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—Pharm. Ztg., lviii (1913), No. 32, 317.

**Milk Powders.**—*Comparative Composition of Full-Milk and Skim-Milk Powders.*—Heinrich Zellner and Ernst Scholze observe that the use of dried milk preparations is recently markedly on the increase, the "full-milk" powder being preferably used in the manufacture of confectionery, cakes and chocolates, while "skim-milk" powder forms the basis for the numerous lecithin and glycerophosphate preparations of the market. The authors have found these preparations to vary in their composition, particularly as regards the content of fat, variations which are of considerable importance in the intended use—the presence of a few per cent. of fat, for example, in "skim-milk" powder rendering it unsuitable for making the lecithin preparations, while the large percentage of fat in "full-milk" powder is a desideratum in the manufacture of confectionery, etc. They have recently had opportunity of examining samples of both kinds of milk powder from two manufacturers, the one designated by the brand "G," produced in Southern Germany, the other, designated "T," from Northern Germany, with the following results:

	Water, %	Albumen, %	In this Digestible Albumen, %	Milk-Sugar, %	Fat, %	Reichert-Meißl Number of the Fat.	Mineral Salts, %	In These P <sub>2</sub> O <sub>5</sub> , %	
Full-milk "G".....	4.27	22.56	22.10	= 98.2	43.37	23.80	28.80	6.06	1.68
Full-milk "F".....	5.57	22.56	22.18	= 98.3	39.39	26.60	39.39	5.88	1.59
Skim-milk "G".....	7.04	31.50	30.96	= 98.3	52.91	0.60	...	7.95	2.33
Skim-milk "F".....	5.71	28.25	27.96	= 98.9	54.06	4.65	...	7.33	2.11

The analytical results show no marked variations between the two brands of milk powder, with the exception of the comparatively high fat content of skim-milk powder "F" (4.65%), which unfits it for the purpose for which it is commonly used. In their physical properties—appearance, solubility, etc.—the corresponding products of the two manufacturers exhibited no essential differences.—Pharm. Ztg., lviii (1913), No. 56, 550.

**Peptonized Milk.**—*Cause of Objectionable Taste.*—T. E. Tawell, having received complaints from time to time of a peculiar taste

in peptonized milk which had been prepared with peptonizing tablets made under his personal supervision, using commercial pancreatin, apparently of unexceptional quality, traced the cause to impurities in the latter, which imparted a distinctly nasty taste to fresh sweet milk after peptonization. The pancreatin itself had no perceptible foreign odor, but the tablets made from several samples, supplied from the same manufacturer at different times and apparently of identical quality, had a distinctly, more or less pronounced odor. The author, therefore, prepared some pancreatin himself using three different solvents upon separate portions—ether, petroleum ether, and "benzoline"—for removing the fatty matters, and found that the pancreatin treated with ether and with petroleum ether gave a peptonized milk of typical flavor, whereas the product from "benzoline" produced a peptonized milk having the identical faintly nauseous taste which had given rise to all the trouble.—Pharm. Journ. and Pharmacist, October 18, 1913, 570.

**Casein.**—*Manufacture in New Zealand.*—The "Chemist and Druggist" observes that during the last few years the use of casein for manufacturing purposes has considerably increased in Europe, especially as a concentrated foodstuff, also in cold-water paints, and in the manufacture of paper. In the last-named industry many German paper-mills have altered their machinery to adapt it for the use of casein surface-paper only, and it is believed that the prospects for the industry are good. With this end in view, New Zealand dairy companies have decided to take up the manufacture on an extensive cooperative scale. Prior to this Mr. J. Pedersen, Dairy Instructor to the New Zealand Department of Agriculture, made a special visit to Europe to study the question, and he has published a full report, in which he states that it is only during the last ten years that the casein industry has developed, its origin being the United States and Germany, and in the last five years the output has increased by over 100 per cent. Three years ago Denmark commenced the manufacture of casein, and has now three hundred factories in operation. Mr. Pedersen states that the outlook for casein manufacture in New Zealand is good, and that the lactic-acid system of making casein discovered by Mr. O. Wennewold, a dairy expert in the employment of the Danish Government, is the most successful process. Chem. and Drugg., Sept. 13, 1913, 435.

**Artificially Colored Casein.** *Observation of a Specimen.*—No

case appears to have been previously recorded of commercial casein having been artificially colored, but recently, in the examination of a large number of samples, F. Franz found one sample which had been treated in this way. It was of a yellowish color, similar to that of the better varieties of casein, but not sufficiently close to it to deceive an experienced eye. The color could be extracted by alcohol or ether. On dissolving the casein a strongly red-colored solution was obtained: the red color faded somewhat on standing, but left a grayish red color much worse in appearance than the original gray color of the sample would have been.—Pharm. Journ. and Pharmacist, December 6, 1913, 841; from Chem. Ztg., September 16, 1913, 1107.

**Egg-Yolk Lecithin.**—*Method of Purification.*—Speaking of the preparation of chemically pure lecithin from egg-yolk, Riedel & Co. mention that this has heretofore been considered a practical impossibility because of the association of the lecithins with components that render them extremely prone to change and decomposition. It has now been determined that their ready decomposition is due to the presence of unsaturated fatty acids in the molecule, and it has been found practicable to convert these unsaturated acids by hydrogenization in methyl alcoholic solution into saturated fatty acids, and, furthermore, to obtain from the hydrolecithin so produced a lecithin of absolute chemical purity. To accomplish this, either of two equally reliable methods may be adopted—the one consisting of the hydrogenization of high-percentage lecithin; the other, starting with the ordinary lecithin of the market, consisting of its hydrogenization, followed by repeated fractional crystallization from acetic ether or methyl acetate. By this method it proved possible to obtain lecithin with a nitrogen content of 1.94%, a content of 3.85% of lipoid phosphorus, and a carbon and hydrogen content conforming to the theoretical composition of distearyl lecithin. The process of preparing “hydrolecithin” by these methods has been protected by patent.—Pharm. Ztg., lviii (1913), No. 27, 266; from Riedel's Berichten, 1913.

**Blood.**—*Detection in Faeces.*—Dr. E. Schlesinger and Dr. J. Jagielski have critically investigated the different methods for the detection of blood in so far as their adaptability for its detection in faeces is concerned, and summarize the results of their investigations, in brevity, as follows: All chemical tests for blood show a series of sources of possible error, an intimate knowledge of which is unnecessary to prevent false interpretations. The guaiac



test is not sufficiently delicate to detect small quantities of blood. The phenolphthalein test is markedly less sensitive than the benzdin test, and besides is liable to more errors than the other reactions. On the other hand, it has been claimed that the benzdin test is too sensitive and subtle; but this reproach is due to the adoption of initial methods of conducting the test which did not assure a positive interpretation of the result. In the form described by Schlesinger and Holst, the benzdin reaction is by no means too delicate; it has that degree of sensitiveness which is adapted to the detection of the smallest evidence of bleedings and has proven indispensable in the present status of clinical technic. Pharm. Ztg., lviii (1913), No. 31, 311; from Med. Klin., 1913, No. 11.

#### FERMENTS AND ENZYMES.

**Digestive Ferments.**—*Effect of Paraformaldehyde, Phenol and Creosote upon Them.*—L. H. Glickman and Charles E. Vanderkleed have made a study of this subject and report as a summary of their experiments the following determinations:

Paraform ( $\frac{1}{4}$  grain) had no inhibiting effect upon the action of either pepsin, pancreatin or diastase.

Three times the normal dose of paraform ( $\frac{3}{4}$  grain) had an inhibiting effect upon the action of pepsin amounting to about 28%, and on diastase to about 10%, but no effect upon the action of pancreatin.

Phenol.—A normal dose of phenol (1 grain) had an inhibiting effect on pepsin, amounting to about 5%, while three times this dose seemed to increase the inhibiting effect only to about 7%. Three grains had no effect upon either pancreatin or diastase.

Creosote.—A normal dose of this (3 minims) had an inhibiting effect upon pepsin amounting to about 10%, while three times this dose (9 min.) increased the inhibiting effect upon pepsin to about 67%, but had no such effect upon pancreatin or diastase.—Proc. Penn. Phar. Assn., 1913, 308-312. (E. C. M.)

**Enzymes and their Significance in Pharmacy.**—Professor A. Tschirch gave an address before the Eleventh International Pharmaceutical Congress held at the Hague on enzymes, which is of great value, but which is not easy to abstract. He summarizes the work on enzymes done by Wroblewski, Trillat, Bertrand, Moore and Whitley, Fischer, Croft, Hill, Rosenthaler, Traube, Bourquelot, Chodat, Bach, Schar, Hérissey, Engler, Weissberg, and others and he emphasizes that there is practically no living plant cell that

is free from enzymes and the same cell frequently contains antagonistic enzymes. He then discusses the decomposing influence of enzymes notably in drying plants and then cites instances of useful enzyme decompositions, such as the "curing" of tobacco and vanilla. In closing, he states that the highest aim of modern pharmacognosy is to study enzymes that all of them may serve mankind.—Schweiz. Wschr. f. Chem. u. Pharm., 51 (1913), Nos. 50, 51 and 52, 765, 777 and 798. (H. V. A.)

**Botanic Distribution of Cyanogenetic Enzymes.**—L. Rosenthaler makes another contribution in his work on the cyanogenetic enzymes. After explaining that what was formerly known as emulsin is really a mixture of at least three enzymes—amygdalase which splits the amygdalin into glucose and mandelonitrile glucoside;  $\beta$ -glucosidase, which hydrolyzes the latter into glucose and benzaldehyde cyanhydrine; and lastly an oxynitrilase, which converts the cyanhydrine into benzaldehyde and hydrocyanic acid. The writer emphasizes the need of more careful study of these three enzymes as to individual properties and—leading to this—study of their occurrence in plants. The latter is the work undertaken in the present paper and the enzymes were detected (a) by the ability to split amygdalin (combined enzymes), (b) by the ability to form synthetic mandelonitriles from benzaldehyde and hydrocyanic acid, (c) by the ability to convert racemic benzaldehyde-cyanhydrine into an optically active oxynitrile.

These three tests giving opportunity of detecting presence of any of the three enzymes of amygdalin were applied to the extracts of 72 plant parts (seeds of 22 plants; fruits, 13; fruit stalk, 1; flowers, 6; stigma, 1; leaves and herbs, 14; entire plant, 1; barks, 5; roots and bulbs, 5; sprouts, 1; cryptograms, 3) representing 33 plant families, the majority, of course, being of the *Prunaceæ*, *Pomaceæ*, and *Rosaceæ*. Twenty of the extracts gave positive reactions to all three tests; 10 gave reactions with two of the three tests; 26 gave reactions with one of the tests, while 6 gave negative results with all three tests, all of which is given in detail and in tabulated form in the original paper.—Arch. d. Pharm., 251 (1913), Nos. 1 and 2, 56 and 81. (H. V. A.)

**Pepsin and Peptase.**—*Differentiation.*—R. Wahl differentiates both as follows: Pepsin is of animal origin, can be prepared in a pure, dry state, and exerts its best action in the presence of mineral acids, especially hydrochloric acid. Peptase is of vegetable origin, is

difficult to prepare in the pure state, and acts best in the presence of lactic acid.—Suedd. Ap. Ztg., 1913, No. 102. (O. R.)

**Pepsin.** *New Method of Valuation.* O. Frey recommends the following new method for the valuation of pepsin: A solution of fresh egg albumen, which will leave approximately 1 per cent. of dry residue, is prepared. One hundred Cc. of this warmed to 50° C. is treated with 10 Cc. of N HCl solution, and the pepsin, accurately weighed, and in solution. The mixture is kept at 50° C. for two hours. Then 10 Cc. of saturated sodium chloride is added, and the liquid is heated for half an hour in the boiling water bath. The undissolved, coagulated albumen is then collected on a tared filter, washed free from chlorides, dried and weighed. Simultaneously a blank experiment is run without any pepsin. The difference in the weight of the two dried albumen residues gives the desired factor.—Apoth. Ztg., xxviii (1913), 787.

**Pepsin Assay.** *Influence upon the Result of Size and Shape of Bottles Used.* In a paper presented in the Scientific Section at the Denver meeting of the Association, Howard T. Graber directs attention to a factor, overlooked in the past and very important from the standpoint of accuracy and uniformity of results in the assay of pepsin; namely, the size and shape of the bottle used in the digestion experiment. He says, the U. S. P. states, in reference to the digestion bottle used with pepsin standardization, to digest in a wide-mouth bottle of 100 Cc. capacity; but the question arises, do you get the same relative amount of digestion in a short, round bottle of 100 Cc. that you do in a taller, square bottle of the same capacity? From the results of his experiments, which are recorded in detail, the author answers this question by an unqualified "No;" different bottles give different results! Using for his experiments tall, wide-mouth, French-square bottles of 3 oz., 4 oz., and 6 oz. capacity, respectively, and a 3 oz. round prescription bottle, much shorter than the others, and conducting his experiments under otherwise identical conditions, including the process of agitation which was accomplished by fastening the bottles to a rotating drum immersed in a water bath during the rotation, the results in three distinct experiments—one with eggs 5 days old, the other two with eggs 8 days old—invariably showed an excess of residue in the short, round bottle, amounting practically to 25% of that remaining under the conditions of the test in the tall, French-square bottles, irrespective of their capacity. This



residue in the latter amounted uniformly to 0.5 Cc., whereas with the same uniformity the residue in the short, round bottles amounted to 0.8 Cc. The author's explanation is that in this style of bottle the contents do not receive the same agitation, due to the bottle being shorter in length and larger in diameter, even though its relative internal capacity is more than bottle No. 3, thus proving that the digestion conducted in a square, long bottle leaves less residue than a short, round bottle of larger internal volume. Moreover, the author finds that in the use of the 6 oz. French-square, it is possible to add first the 10 Gm. of egg albumen, then all the acid, and finally the requisite amount of pepsin solution, and after securely inserting the stopper, to pound it upon a pad and completely disintegrate the albumen. With all the other sizes of bottles the directions of the Pharmacopœia to disintegrate the albumen first with a small quantity of the acid and a rubber-tipped glass rod and gradually wash rod with balance of acid, must be followed. The use of the larger taller bottles is therefore recommended.—Journ. A. Ph. A., December, 1914, 1507–1508.

**Pepsin Assay.**—*Variation in the Strength of Hydrochloric Acid Used a Disturbing Factor.*—L. Henry Bernegau and Leo H. Glickman record the results of an investigation undertaken to determine the cause of variation in results in the hands of different operators by the official method of pepsin assay. Using (1) the U. S. P. VIII method, (2) the revised method proposed for the U. S. P. IX, which differs simply in the method of manipulation, and (3) a third method, which also differs slightly in the manipulation, the authors obtained concordant results by all of them, if carried out strictly according to directions, giving preferences, however, to method No. 2. This differs from the U. S. P. VIII method in that, instead of adding 20 Cc. of diluted hydrochloric acid at once to the 10 Gm. of white of egg, only 2 Cc. at a time are added and the white of egg disintegrated with a glass rod tipped by a piece of pure rubber tubing—this procedure having the advantage of more easily disintegrating the compressed mass of white of egg resulting from its passage through the sieve than if the 20 Cc. of acid are added at once. Some samples of pepsin previously analyzed by the authors and found to be of required strength were, on request, submitted to a certain college for comparative tests; but the undigested egg albumen left on their assays varied considerably from the amounts subsequently reconfirmed—obtained by them. Further investigation to ascertain the cause of



this discrepancy in results then showed conclusively that it is due to variations in the strength of the acid employed. The U. S. P. hydrochloric acid is required to contain 31.9% absolute hydrochloric acid by weight; most manufacturers, however, turn out a product usually containing 32% to 35%—sometimes as high as 38%. The U. S. P. requires a (diluted) acid which assays exactly 0.3% HCl, and the author's results show that this requirement must be strictly carried out in conducting the test, *the digestive power of pepsin on egg albumen being lowered by using either a lower or higher percentage of hydrochloric acid than that of 0.3%.*—Journ. A. Ph. A., February, 1913, 152–153.

**Pepsin and Rennet.**—*Assay.*—H. Engelhardt and O. E. Winters have made investigations to determine what effect the age of the eggs used to furnish the albumen for testing pepsin, has upon the results of tests, and they report that the results of their experiments show that the albumen from eggs one month old was more soluble than that from fresh eggs, and that a pepsin might pass the official test, using albumen of that age, while not being able to do so with a fresher sample. As a result of their tests they believe it would be advisable to increase the amount of undissolved albumen at the conclusion of the test from 1 Cc. to 2 or 3 Cc. They call attention also to the fact that the quality of the milk employed in the assay of rennet is an important factor in determining the value of its products; that milk which contains preservatives will not curdle as quickly as fresh, pure milk, containing no such additions.—Proc. Md. Phar. Assn., 1913, 52–54. (E. C. M.)

**Rennin.**—*Action on Casein.*—Some researches by A. W. Bosworth regarding the action of rennin on casein have shown that a solution of calcium caseinate neutral to litmus and free from all other salts is not curdled by rennin, but that a solution of calcium caseinate acid to litmus, which contains two equivalents of base for each molecule of casein, is curdled by rennin. Solutions of ammonium, sodium or potassium caseinates are not curdled by the ferment. In such solutions, however, the casein is changed to paracasein, the paracaseinates of these bases being soluble. When paracasein is produced from casein by the action of rennin no other substance is formed. Two molecules of paracasein are produced from each molecule of casein as a result of this action. Rennin is not, strictly speaking, a coagulating ferment; the coagulation is a secondary effect, the result of a change in solubilities. Rennin action is probably a hydrolytic cleavage and may be con-

sidered the first step in the proteolysis of casein. It would follow from this that the action now attributed to rennin may be produced by any proteolytic enzyme.—*Jour. Amer. Med. Assoc.*, September 13, 1913, 898.

**"Casease" and Trypsin of Vegetable Juices.**—*Identity with the Rennet Ferment.* Gerber finds that the milk-curdling rennet ferment, also the so-called "casease" and trypsin of vegetable juices, are not three separate substances, but merely different phases in the action of one and the same diastase. This diastase is often specific for the particular latex from which it is derived, and will successively coagulate milk, and hydrolyze casein or fibrin until amino-acids result. The differences observed in the successive phases are due, not to different ferments, but to the products of disintegration of the complex albuminoid molecule; the splitting up of which is effected by one and the same ferment. Proteolytic vegetable ferments may be classed in two groups. The diastase of the latex of *Ficus carica* is typical of one. This neither coagulates raw milk nor digests casein nor fibrin in presence of traces of salts of silver, copper, mercury, or of chlorine, bromine, iodine, or of hydrogen peroxide. The other type is represented by the diastase of *Broussonetia papyrifera*, which coagulates milk and digests casein and fibrin actively in presence of considerable quantities of these substances almost as energetically as when they are absent. *Pharm. Journ. and Pharmacist*, August 23, 1913, 323; from *Compt. rend.*, 157 (1913), 241.

**Pancreatin.**—*A Spurious Article.* Charles H. LaWall, Ph.M., calls attention to a spurious pancreatin composed in part of powdered malt, which adulteration, because of its raising the starch-converting power of the sample which is sometimes the only test applied—is likely to pass undetected unless other tests are used to determine the purity of this drug. *Proc. Penn. Phar. Assn.*, 1913, 224. (E. C. M.)

**Saliconase.**—*A New Ferment in Almonds.* It has long been known that the emulsin of almonds is a mixture of several specific diastases, to which G. Bertrand and A. Compton add another. This has been called "saliconase," and it is to this that the hydrolyzing power of emulsin on salicin is due. It is distinguished by a lower optimal temperature for its reaction than other almond diastases. For two hours this is 52.5° C., and for fifteen hours 42.5° C. Also its optimal reaction medium is an extremely feebly acid solution; not more acid than a solution of almond emulsin in water. For

two hours' contact this medium is equivalent to 0.375 Cc. of N. 100  $\text{H}_2\text{SO}_4$ , and for fifteen hours, only 0.06 Cc. Pharm. Journ. and Pharmacist, December 6, 1913, 841; from Compt. rend., 157 (1913), 797.

#### SERA AND VACCINES.

##### **Federal Control over the Manufacture of Serums and Vaccines.**

John F. Anderson says that under the authority of an Act of Congress, approved July 1, 1902, the Public Health Service maintains a supervision over the manufacture and interstate sale of viruses, serums, toxins and analogous products. Supervision is maintained in accordance with the regulations that have been promulgated in regard to the licensing, inspection and examination of the products, and the license may be suspended or revoked if upon examination it is found that the product is deficient or the production of the product is not in accord with the regulations as promulgated. It is to be understood that a license to manufacture a given biologic product is not a guarantee of therapeutic value, though in connection with at least two sera the standards established do secure to the physician and his patients a product of uniform reliability.—J. Am. M. Assoc., 1913, v. 61, 659–661. (M. I. W.)

**Germ-Free Lymph.** *Preparation.* Dr. Seiffert and Dr. Hühne's investigations have demonstrated that lymph may be made germ-free by the addition of chinisol, without suffering diminution in activity or stability. The most serviceable concentration appears to be 3 parts of chinisol per 1000 lymph. Investigations of stronger solutions are still in progress.—Pharm. Ztg., lviii (1913), No. 90, 901; from Z.-Bl. f. Bakteriöl., Parasitenk. u. Infektionskrankh., 1913, 71, 86.

**Vaccine Therapy.**—John H. Richards reviews the recent literature relating to vaccine therapy and concludes that vaccines are for one purpose only, that is, to produce prophylactic immunity and to increase the resistance of an individual by active immunization, and they should never be used to the exclusion of other methods of treatment that tend to limit the extent of an infection.—J. Am. M. Assoc., 1913, v. 61, 845–847. (M. I. W.)

**The Scientific Basis for Vaccine Therapy.**—Richard M. Pearce summarizes the present status of vaccine therapy; discusses the relative value of autogenous vaccines and of mixed vaccines, and concludes that prophylactic vaccination rests on a sound scientific

basis of experimental study and clinical observation, while curative vaccination has no sound scientific basis; but the application of the general principles of immunity as well as clinical observation offer a plausible basis for the treatment of localized, more or less chronic infections, and of carriers. On the other hand, no satisfactory basis is at hand for a curative vaccination in the acute self-limited diseases characterized by general dissemination and systemic infection. All attempted vaccinations in this group must be considered as purely experimental.—*J. Am. Med. Assoc.*, 1913, v. 61, 2115–2119. (M. I. W.)

**Bacterial Vaccine Therapy.**—A comprehensive discussion of bacterial vaccine therapy, its indications and limitations from a practical point of view, leads to the conclusions that:

Vaccine therapy is a highly specialized field of medicine whose successful pursuit calls for a particular training in bacteriology, immunology and clinical medicine.

The therapeutic possibilities of vaccine therapy have been exaggerated.

The promiscuous use of the stock bacterial vaccines of commerce in the treatment of acute and chronic infections is an irrational procedure.

Ready-mixed commercial vaccines should be abolished.

In cases suitable for bacterial therapy, autogenous vaccines are with few exceptions superior.

Autogenous vaccines should be prepared by those in touch with the patient and not through the agency of remote laboratories.—*J. Am. M. Assoc.*, v. 60, 1298–1299, 1360–1361, 1459–1461, 1539–1541, 1621–1622, 1704–1705, 1791–1792, 1880–1881, 1955–1956, and 2046–2047. (M. I. W.)

**Bacterial Vaccines in Acute Septic Conditions of the Mouth.**—

L. S. Medalia attempts to show by a citation of cases that vaccine treatment is of value in acute septic dento-alveolar abscesses, even the worst types of mandibular impacted third-molar abscesses having apparently yielded well to this treatment. Such cases with septic apical abscesses, especially the deep-seated ones or the so-called blind abscesses, acute and subacute, have been greatly benefited by the vaccination method of treatment. Medalia believes that there is a big field for vaccine treatment in acute and subacute dento-alveolar abscess cases and its wide-spread use will save considerable suffering and loss of teeth to the patient, and annoy-



ance to the dentist. (Boston M. & S. J., v. 169, No. 22.)—J. Am. M. Assoc., 1913, v. 61, 2189. (M. I. W.)

**Vaccines.** Theobald Smith discusses the present-day use of vaccines, the methods of conferring immunity, the relation of immunizing and toxic elements of vaccines and the difficulties attending the use of vaccines. He concludes that in processes associated with fever and bacteriemia, science says hands off until we know whether we have a progressive disease with gradual undermining of the resistance or a more localized affection in which the excursions into the blood are secondary. In any case the use of vaccines must be regarded as experimental and should not be undertaken save in conjunction with one trained in the immunologic problems.—J. Am. M. Assoc., v. 60, 1591-1599. (M. I. W.)

**Vaccines.**—W. A. Puckner enumerates the following as among the vaccines and sera accepted for N. N. R.: acene vaccine, bacillus Bordet-Gengou vaccine, Friedlaender vaccine, gonococcus vaccine, meningococcus vaccine, pneumococcus vaccine, bacillus pyocyaneus vaccine, staphylococcus vaccines, streptococcus vaccines, typhoid vaccine, new tuberculin, Koch, bacilli emulsion ("B. E."), cholera agglutinating serum, anti-gonococcus serum, anti-streptococcus serum, and normal horse serum.—J. Am. M. Assoc., 1913, v. 60, 1074, 1227, 1461, and v. 61, 27, 568, and 1900. (M. I. W.)

**Vaccine Virus.**—*Effect of Glycerin.*—The virus of variola and of vaccinia is less sensitive to the action of glycerin than bacteria in general, and for this reason it is possible to obtain an almost pure virus of practically full strength. Prolonged action of the glycerin, however, destroys the virus, but more rapidly at  $37^{\circ}$  C. ( $98.6^{\circ}$  F.) than in the cold; if kept at from  $-5$  to  $-15^{\circ}$  C. (from  $23$  to  $5^{\circ}$  F.), glycerinated virus may remain active for five years.—J. Am. M. Assoc., v. 61, 2074. (M. I. W.)

**Vaccines and Local Anaphylaxis.**—Joseph H. Barach observes that the ordinary vaccination with cow-pox creates little interest in the mind of the practicing physician and the results are not carefully observed. The frequently observed lighting up of a first apparently unsuccessful vaccination when the revaccination does take, is probably due to local anaphylaxis. The first inoculation results in the production of antibodies against the strange virus substance, it sensitizes the organism. At the second inoculation the virus, wherever deposited, is attacked by the antibodies, and in this attack certain "by-products" are let loose. These

"by-products" act as poisons and produce the anaphylactic reaction. In this case the reaction is limited to local manifestations. In other instances when the dose is large, or when the protein and antibody are diffused throughout the organism, the anaphylactic reaction is constitutional. —J. Am. M. Assoc., v. 60, 569–570. (M. I. W.)

**Vaccination against Diphtheria.**—Hornemann describes von Behring's method of vaccination against diphtheria based on the recognition of the fact that there is no neutralization of the diphtheria toxin possible in the test-tube, definite and irreversible. The experience with the method is still limited, but theoretically, it seems to be promising. (Therap. Monatsh., Berlin, 1913, v. 27, No. 11.)—J. Am. M. Assoc., 1913, v. 61, 2281. (M. I. W.)

**"Friedmann Vaccine."**—"Friedmann Institutes" are being organized in various parts of the country and the personnel of these organizations in practically every instance is sufficient to suggest their true nature. Steps have been taken in several states to check this exploitation of the consumptive for commercial gain. But what is most needed is that these unscrupulous attempts should be met with an intensive campaign of education of the public concerning the dangers and worthlessness of this treatment.—J. Am. M. Assoc., 1913, v. 61, 1050.

**Friedmann Tuberculosis Treatment.**—The results of the proceedings of the Berlin Medical Society were that Dr. Friedmann's claim to cure tuberculosis was held to be not well founded. Men of high scientific standard who had handed cases over to him have expressed a very doubtful opinion of the results, and his theory has also been severely criticized by competent bacteriologists. The warning of the Lancet against regarding Dr. Friedmann's treatment as a scientific discovery for the cure of tuberculosis was thus justified, and was all the more necessary, as some English daily papers were propagating a story of success.—J. Am. M. Assoc., v. 60, 309. (M. I. W.)

**Friedmann Cure.** The following are quotations from a document submitted by the Secretary of State to the President and transmitted by the latter to the Senate, entitled "The Friedmann Treatment for Tuberculosis" which was published as Senate Document No. 1018. It consists largely of a rather liberal translation of Dr. Friedmann's Berlin address and the discussions on it as they appeared some time ago in the Berliner

klinische Wochenschrift. J. Am. M. Assoc., v. 60, 672-673.  
(M. I. W.)

**Scorpion and Serpent Venoms.**—*Comparison of Their Effects.*—According to the researches of M. Arthus, the venom of the Egyptian scorpion, *Buthus quinque-striatus*, is totally different in its effects from the venom of serpents, when injected into the veins of the rabbit, or the dog. It occasions a very marked rise in the arterial pressure: snake poison, on the other hand, causes a depression, but does not affect the cardiac rhythm whereas Egyptian scorpion venom slows down the heart-beat. The effect of scorpion venom is due to its action on the extra cardiac reflex. The hypertension is apparent in twenty to thirty seconds after the injection. It does not occur when a dose of the anti-scorpion serum of the London Lister Institute is administered simultaneously, or immediately before or after the scorpion poison. The venom of a small Algerian scorpion differs in its action from the above. It produces, at first, a marked depression of the arterial tension with a diminution of the cardiac oscillations, similar to that produced by the toxic albuminoids: then follows a hypertension similar in amount and duration to that produced by Egyptian scorpion poison. The poison of the Brazilian rattlesnake, the "cascavel," *Crotalus terrificus*, when administered in a non-coagulating dose, has a remarkable action on the blood-pressure. At first, there is a sudden and considerable fall; followed, in thirty seconds, by an enormous rise; then in ninety to one hundred and twenty seconds there is another fall, which persists. At the same time slowing of the heart-beat occurs, as in scorpion poisoning, and acceleration of the respiration, as in albuminoid intoxication. Somewhat similar but less intense reactions are obtained on injecting chicken-blood serum into the veins of rabbits. If scorpion poison, instead of being injected into the veins of a fresh rabbit, is thus administered to one previously dosed by hypodermic injections of the same venom, a depression occurs immediately after treatment, followed by a considerable and durable hypertension, somewhat resembling the effects produced by cascavel poison.—Pharm. Journ. & Pharmacist, September 6, 1913, 373.

**Crotalin.** *Collection of This and Other Snake Venoms.*—Mr. Walter Rothwell describes the method of collecting the venom of the *Crotalus horridus* (rattlesnake), its preparation for use in medicine and its effect upon the human system. Snake venoms, he says, vary in color from pale amber to deep yellow. After

filtration they are dried between glass plates, under bell jars. In this crystalline state they appear to keep indefinitely. The venom or crotalin is administered hypodermically, in doses of from  $\frac{1}{200}$  to  $\frac{1}{50}$  of a grain, for the cure or the relief of epilepsy, and its administration is said to be of wonderful efficacy.—Proc. Penn. Phar. Assn., 1913, 276-278. (E. C. M.)

**Crotalin.** A few years ago rattlesnake venom was being used in the treatment of respiratory diseases and had a very enthusiastic advocate in Dr. Thomas J. Mays of Philadelphia. Dr. Mays used the preparation in the treatment of tuberculosis. He had for an assistant Dr. R. H. Spangler who, later, began using the same material in the treatment of epilepsy; newspaper articles followed the reading of some of Dr. Spangler's papers. According to our understanding, Dr. Spangler does not assert that rattlesnake venom will cure epilepsy; he emphasizes the fact that its utility in epilepsy is practically confined to the idiopathic form in which no serious brain changes have occurred; that is to say, the initial stages of the disease. In properly selected cases, however, he asserts that it does alleviate the symptoms and that, in some cases, there is a cessation in the attacks for periods which encourage further investigation.—J. Am. M. Assoc., v. 60, 850-851. (M. I. W.)

**Crotalin in the Treatment of Epilepsy.**—The fashion of using biologic products of extreme toxic potency is on us. It seems unnecessary to have these products accurately standardized, or to have their employment in human beings preceded by careful animal experimentation in which both the immediate and remote effects of such toxication can be determined. So long as a profound "reaction" is produced the end in view seems to have been attained, for by that reaction, if one may credit the enthusiastic reports of the advocates of these new and heroic therapeutic adventures, beneficial results in diseases otherwise practically incurable, epilepsy for instance, seem attainable.—J. Am. M. Assoc., v. 60, 1001. (M. I. W.)

**Serodiagnosis.**—*Abderhalden's Method.*—The essential of Abderhalden's method of serodiagnosis is the determination in the dialysate of the products of digestion of proteins. In pregnancy the serum contains ferments capable of digesting placenta or fetal products. These are therefore mixed, after thorough washing, with the serum and subjected to dialysis. If the dialysate shows the presence of products of digestion of proteins, the test is positive.



In the test for dementia præcox the author used pulped-up testicles with some serums, on the theory that the affection is connected in some way with the presence of incompletely digested products from the sexual organs. In other cases he used brain tissues in the same way.—*J. Am. M. Assoc.*, v. 60, 1727. (M. I. W.)

**The Present Status of Abderhalden's Serodiagnosis.**—So far as pregnancy is concerned Abderhalden's test gives us a method of diagnosis of practical value and wide applicability. The results at hand show that the ferment is present in the blood from the sixth week after the last menstruation until the end of the third week post partum. Experiments on animals have shown that the reaction may be obtained within twenty-four hours after implantation of an ovum, so that this method of diagnosis promises to have a very wide field of application.—*J. Am. M. Assoc.*, 1913, v. 61, 493-494. (M. I. W.)

**Abderhalden's Serum Test in Tuberculosis.**—F. Jessen states that the dialysis method of Abderhalden is uncommonly instructive in tuberculosis, not only differentiating the tuberculosis but pointing out the special organ involved. He tabulates the findings in 381 applications of the test. (*Beit. Klin. Tuberk.*, 1913, v. 28, No. 3.)—*J. Am. M. Assoc.*, 1913, v. 61, 2277. (M. I. W.)

**Abderhalden's Serodiagnosis in Internal Medicine.**—J. Bauer reviews the literature on this subject to date, all the evidence tending to confirm the existence of specific ferments, digesting certain organ tissues. At the same time it must not be forgotten that in most cases the ferments are not absolutely specific but tend to be polyvalent. A kind of codigestion (*Mitabbau*) may occur like the coagglutination in serology. It is only a question of time, however, when the technique will be perfected to avoid these group reactions. At present, we are only at the beginning of the harvest to be reaped from Abderhalden's method. (*Med. Klin.*, v. 9, No. 44.)—*J. Am. M. Assoc.*, 1913, v. 61, 2199. (M. I. W.)

**Serodiagnosis in Scarlet Fever.**—Schultz and Grote report a study on 27 children with scarlet fever and 13 controls which were tested for specific ferments in their serum. With 3 exceptions, the serum of all the scarlet fever children digested lymph node tissue when the test was applied between the 5th and 32d days of the disease, but none before or after these dates. Positive findings were also

obtained in 7 of the controls, namely, in a case of hebephrenia, of endometritis, of polyp in the ear, or of acute or chronic polyarthritis, and in two pregnant women. The digestion proceeded the same whether the lymph node tissue had been derived from a scarlet fever patient or not. (Münch. Med. Wschr., 1913, v. 60, No. 45).—J. Am. M. Assoc., 1913, v. 61, 2280. (M. I. W.)

**Antistaphylococcic Serum.**—B. A. Thomas says biologic therapy by a potent polyvalent antistaphylococcic serum is more effective in the presence of a staphylococcic bacteremia than is the corresponding autogenous bacteria.—J. Am. M. Assoc., v. 60, 1070-1073. (M. I. W.)

**Antistreptococcus Serum.**—According to George H. Weaver much difference of opinion has existed as to the therapeutic value of antistreptococcus serum. The multiplicity of strains of streptococci which infect man is so great that a serum which is to be employed in the treatment of all of them should be prepared by injecting the animal yielding the serum with all the varieties obtainable.—J. Am. M. Assoc., v. 61, 661-663. (M. I. W.)

**Ninhydrin.**—The fact that triketohydrindenhydrate or "ninhydrin" reacts with protein derivatives which no longer give the delicate biuret reaction has made it doubly useful in following the transformation of the albuminous substances into their non-protein components. Abderhalden has applied the new reagent in his serum test for the diagnosis of pregnancy which has already become a routine procedure in some quarters.—J. Am. M. Assoc., 1913, v. 61, 415. (M. I. W.)

**Ninhydrin** occurs in the form of colorless crystals readily soluble in water. When heated it becomes red at  $125^{\circ}\text{C}$ ., swells at  $139^{\circ}$  and melts at  $239^{\circ}$ - $240^{\circ}\text{C}$ . The aqueous solution colors the skin violet and reduces Fehling's solution. When heated to the boiling point in aqueous solution it gives a blue color in the presence of protein bodies or amino acids derived from them which have the amino group in the alpha position in relation to the carboxyl. It gives this reaction with compounds that no longer respond to the biuret reaction. Ninhydrin is not employed therapeutically, but is used as a reagent to determine the presence of albumin, peptone, polypeptids, and amino acids. This test is especially applied to demonstrate the presence in blood serum of specific proteolytic ferments, especially in the diagnosis of pregnancy,

according to the method of Abderhalden.—J. Am. M. Assoc., 1913, v. 61, 1377. (M. I. W.)

**Ninhydrin Reaction as a Test for Peptone.**—According to S. L. Cherry, ninhydrin works best in a strictly neutral medium. Slight acidity or alkalinity destroys its delicacy. Fluids should be made neutral before testing, litmus being used as an indicator.—J. Am. M. Assoc., 1913, v. 61, 2313. (M. I. W.)

**Ninhydrin Reaction.**—Richard M. Pearce reports negative results with the ninhydrin reaction as a test for amino acids in the serum of nephritics and others. A few tests were made also with ascitic fluid, but with like negative results. J. Am. M. Assoc., 1913, v. 61, 1456-1457.

**Antimeningitis Serum.**—S. P. Kramer finds a possible source of danger in the use of antimeningitis serum. He reports six cases of death with respiratory paralysis a few minutes after the injection and two cases in which the respiratory paralysis was relieved by artificial respiration, the children dying later of the disease.—J. Am. M. Assoc., v. 60, 1348-1351. (M. I. W.)

**Antimeningitis Serum.**—Simon Flexner discusses the report of accidents following the subdural injection of antimeningitis serum.—J. Am. M. Assoc., v. 60, 1937-1940. (M. I. W.)

**Bacterial Therapy.**—Willard J. S. Stone presents some observations on the use and abuse of bacterial therapy and cautions against the use of vaccines or toxins in the treatment of diseases, the etiology of which is unknown and the treatment therefor purely empirical.—J. Am. M. Assoc., v. 60, 489-494. (M. I. W.)

**Typhoid Bacilli.**—Gay and Claypole make observations on induced variations in the agglutinability of *Bacillus typhosus*. Variations in the agglutinability are so marked in freshly isolated strains of the microorganism that not infrequently it is impossible to identify them as true typhoid bacilli even by the use of potent immune serum until they have grown for several generations on culture mediums. This failure in identification at best delays diagnosis and has at times led to error. J. Am. M. Assoc., v. 60, 1141. (M. I. W.)

**Tubercle Bacilli.**—Rogers and Murphy report the finding of acid-fast bacilli in circulating blood. They examined the blood from a number of incipient, moderately advanced and far ad-

vanced cases of pulmonary tuberculosis and found acid-fast bacilli morphologically identical with the tubercle bacilli in all of them. They were also able to demonstrate the acid-fast bacilli in five apparently normal individuals with the Kurashigi-Schnitter method.—J. Am. M. Assoc., v. 60, 995-996. (M. I. W.)

**Tuberculin.**—Francine and Hartz report their results with tuberculin (Dixon), a tubercle bacilli extract prepared after the method of S. G. Dixon, and report a number of cases which were distinctly improved in health and were able to resume and remain at regular work during and after the course of tuberculin treatment.—J. Am. M. Assoc., v. 60, 717-721. (M. I. W.)

**Nomenclature of Tuberculin Doses.** J. A. Codd would select as a final unit the smallest dose likely to be given. He suggests the Greek letter  $\psi$  and the word psilon which may be conveniently translated "shred," "residue" or "atom." Thus fractions may be obviated, the dose being given in psilons until it reaches the cubic millimeter, and then be given in cubic millimeters until it reaches the cubic centimeter. (British M. J., 1913, v. 2, 529-583.)—J. Am. M. Assoc., 1913, v. 61, 1073. (M. I. W.)

**Diphtheria Antitoxin.**—According to R. B. Mixsell the intravenous administration of antitoxin in young children, although not always easy, is perfectly safe when done with skill and care. The operation does not, as a rule, commend itself.—J. Am. M. Assoc., 1913, v. 61, 992. (M. I. W.)

**Diphtheria Carriers.**—The results of certain experience recently reported indicate that a really serviceable method to hasten the disappearance of diphtheria bacilli from the throats and noses of carriers may have been found. A Danish physician, Schiötz, has used broth cultures of staphylococci in the throats of chronic carriers of diphtheria bacilli with altogether fine results and there are now several reports on hand with equally satisfactory results of this procedure in the hands of other observers.—J. Am. M. Assoc., v. 60, 1546. (M. I. W.)

**Lactic Acid Bacillus Spray for Diphtheria.**—Harold B. Wood reports the use of a spray of lactic acid bacilli in the treatment of refractive diphtheria carriers. The treatment was used with markedly satisfactory results.—J. Am. M. Assoc., 1913, v. 61, 392-393. (M. I. W.)



**Diphtheria Carriers.** A. M. Alden submits a report on the staphylococcus-spray treatment of diphtheria carriers. He concludes that no patient having had diphtheria should be released from quarantine until at least two consecutive negative cultures are obtained from both nose and throat, and ear if symptoms are present. Antitoxin will not free the patient from the carrier condition, but some local application is necessary to rid the throat and nasal passages of *B. diphtherie*. In fifteen out of sixteen cases the staphylococcus spray effectively cleared the throat of *B. diphtherie* after other methods had failed. Apparently no harm resulted to the patient from the use of the spray.—J. Am. M. Assoc., v. 60, 1876-1878. (M. I. W.)

**Staphylococcus. Use of Spray.** W. A. Womer reports the results of staphylococcus spray in the treatment of 42 cases of diphtheria carriers. Of the 42 cases, 12 cases, or 28.5 per cent., cleared up before 30 days, while out of 42 throats treated without the spray, 8, or 19 per cent., cleared up before 30 days. The use of the spray caused no unpleasant symptoms but did not appreciably lessen the period of quarantine. Apparently most diphtheria carriers do not spread the disease after 60 days from the day it begins and public health officials could work more effectively if they had some practical method of determining the virulence of the diphtheria bacilli found in the throats of carriers.—J. Am. M. Assoc., 1913, v. 61, 2293-2294. (M. I. W.)

**The Administration and Value of Tetanus Antitoxin.**—The growing practice of giving antitoxin for curative purposes by the intraspinal route received increasing support from both the statistical and the experimental sides. Toxin travelling along the nervous tissues is not readily neutralized by antitoxin in the blood, but antitoxin in the spinal fluid can meet the toxin in the nerve roots, and probably in the cord itself.—J. Am. M. Assoc., 1913, v. 61, 687. (M. I. W.)

**Tetanus from Gelatin.** More than ten years ago Dr. John F. Anderson, the present director of the Hygienic Laboratory of the United States Public Health Service, called attention to the occasional presence of tetanus spores in samples of commercial gelatin. Abderhalden has just reported a typical death from tetanus in an experimental animal that had been maintained for several weeks in a metabolism cage and fed with gelatin. The case is one of exceptional interest inasmuch as no wound or injury which might serve as a portal of entry for the infectious agent

could be detected after the most painstaking examination.—J. Am. M. Assoc., v. 60, 1366. (M. I. W.)

**Rabies and the Pasteur Treatment.**—The work of Pasteur drew the attention of the medical profession and the laity to rabies, which up to that time had apparently been neglected. The fatality among Pasteur-treated patients is less than 1 per cent., while the death rate for all persons bitten by rabid animals is considered to be from 15 to 20 per cent.—J. Am. M. Assoc., 1913, v. 61, 1923. (M. I. W.)

**Wassermann Reaction.** The cobra venom test for syphilis appears to be less sensitive than the Wassermann test in parasymphilitic affections and in syphilis of the nervous system. In general the present evidence tends to show that it is not so reliable as the Wassermann reaction, although it may be serviceable in confirming it, or possibly in complementing it in latent cases. It should be remembered, however, that the test has not yet been applied to a sufficient number of cases to permit very definite conclusions to be drawn.—J. Am. M. Assoc., v. 60, 1657. (M. I. W.)

**Wassermann Reaction.** Varney and Baeslack report a comparative study of antigens for the Wassermann reaction. They conclude that the use of syphilitic gumma in the testis of rabbits yields a more specific antigen than any obtained from other syphilitic or normal tissue. The combination of a number of strains, giving a polyvalent antigen, increased the value of the antigen, permitting the diagnosis of clinically doubtful cases. Aqueous antigens lose their strength in about one month while those prepared with acetone and alcohol are stable.—J. Am. M. Assoc., 1913, v. 61, 754-756. (M. I. W.)

**Wassermann Reaction.** A. Post says the Wassermann reaction should be regarded as a symptom like other symptoms, and in relation to other symptoms, it will prove a wonderful help. To insist on calling it a test confuses rather than aids. (Boston M. & S. J., v. 169, No. 22.)—J. Am. M. Assoc., 1913, v. 61, 1289. (M. I. W.)

**Wassermann Reaction.**—John H. Richards contributes a study of the Wassermann reaction in diabetes mellitus with special reference to its relation to acidosis. Four cases of diabetes with marked acidosis all gave positive Wassermann reactions which

were unaffected by antisyphilitic treatment. The results lead to the conclusions that a positive Wassermann reaction is not indicative of syphilis in cases of diabetic acidosis. J. Am. M. Assoc., v. 60, 1139-1141. (M. I. W.)

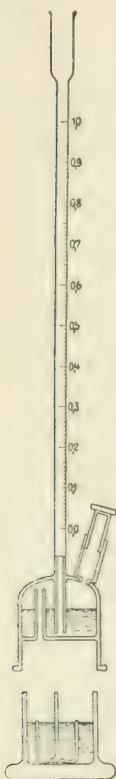
**Wassermann Reaction.** Charles F. Craig discussing the interpretation of the results of the Wassermann reaction asserts that conclusions based on a single positive or negative result are entirely unwarranted and lead to the infection of innocent individuals on the one hand and to great mental and physical suffering by those unjustly stigmatized as affected with this dreaded disease on the other.—J. Am. M. Assoc., v. 60, 565-569. (M. I. W.)

**Abderhalden's Method of Carcinoma.**—According to R. St. L. Brockman, there is sufficient evidence to show that the blood of persons suffering from carcinoma contains a substance absent in the blood of all others, and that this substance has a proteolytic action on the carcinoma tissue only. There are also several factors which point to its being of the nature of a ferment. If the serum from a patient is left to get stale it becomes inactive, but the addition of a trace of fresh human serum will activate it again. The reaction takes place best at 38° C. At room temperature the reaction does not occur, while heating the serums to 55° C. for five minutes inactivates it beyond recall. If, then, as is maintained, this substance is of a protective nature, it would be natural to expect to find it present in larger quantities in patients who were in good general health. The results of these tests point strongly to such being the case. The author has noticed throughout the whole series that a patient with a growth of the tongue or of the breast who is in good general condition will give an intensity of coloration in twelve hours which a patient in a low state of health would fail to give in twenty-four hours. (Lancet, v. 2, No. 4704.)—J. Am. M. Assoc., 1913, v. 61, 2195. (M. I. W.)

#### URINARY AND BILIARY COMPOUNDS.

**Urine.** *Preservation with Boric Acid for Analysis.* George E. Ewe and Charles Vanderkleed recommend the addition of boric acid to samples of urine collected for analysis. They say that the addition of two grains to four ounces of a sample preserved it for 6 days, and that four grains to the same amount kept it intact for 9 to 10 days. As the boric acid does not interfere with the ordinary tests applied to urine the value of the use of this acid is apparent.—Proc. Penn. Phar. Assn., 1913, 326. (E. C. M.)

**New Ureometer.**—*An Instrument of Precision.*—Heyninx has constructed a precision ureometer (shown in the accompanying drawing, Fig. 62) for the determination of urea in urine, in blood and in the cerebrospinal fluid. It consists of two parts, the lower, thick-walled being for the reception of the hypobromite solution and the liquid under examination, the latter in a capsule which is lowered into the reagent by the aid of the central rod shown. The upper part, which fits air-tight over the lower, consists of a glass vessel communicating with the lower by a tube extending to near the top, and is surmounted by a graduated tube which extends downward to near the bottom. This upper vessel has sufficient capacity to permit the introduction of about 25 Cc. of water through the lateral tube on top, which is then stoppered. The fluid under examination having been carefully lowered into the hypobromite solution, and the upper part containing the water securely attached, the apparatus is gently inclined and a mixture of the fluid and reagent thus effected. Nitrogen is at once generated, passes into the upper vessel and forces the water into the graduated tube. When the reaction is completed, a reading of the scale gives directly the percentage of urea in the liquid under examination.—Pharm. Ztg., lviii (1913), No. 58, 572; from Biochem. Ztschr., 51 (1913), No. 5.



Ureometer.

**Kjeldahl Assays in Urinary Work.**—*Interference of Nitrates.*—Spindler has found that the average Kjeldahl nitrogen estimation in urinary work is unreliable and attributes the trouble to the presence of nitrates, which are reduced to nitrites and these in turn act on the ammonia converting it into nitrogen gas. He experimented with mixtures of potassium nitrate; with ammonium sulphate and sodium chloride; with urea and sodium chloride, and with urea alone; and in each case he found that the addition of as little as 0.1 Gm. of nitrate lessened materially the ammonia figure in the Kjeldahl estimation. This is worth careful attention in urinary work, since a vegetable diet produces a urine containing a considerable amount of nitrates. He has found no practical method of destroying the nitrate before running the Kjeldahl assay and therefore suggests that preliminary to the ammonia distillation a rough colorimetric estimation of the urine by means



of diphenylamine solution be made and that care be taken that the sample of urine taken for the Kjeldahl estimation contain less than 0.1 Gm. of nitrate.—Schweiz. Wschr. f. Chem. u. Pharm., 51 (1913), No. 35, 517. (H. V. A.)

**Urine.**—*Diazo Reaction.*—K. Feri recommends the use of paranitrodiazobenzolsulphate (Azophorrot P. N.), an aqueous solution of which is added to the urine, which has previously been made alkaline. Upon the appearance of a beautiful bright red color a positive reaction is indicated. Wien. Klin. Wschr., 1912, No. 24. (O. R.)

**Urine.**—*Volumetric Determination of Urea.*—Prof. Dr. Adolf Jolles of Vienna calls attention to the fact that the present determination of urea with hypobromite solution is inaccurate and proposes the following methods:

1. Prepare a solution containing 150 Gm. NaOH, 250 Cc. H<sub>2</sub>O and 25 Gm. Br. The errors with this solution are considerably smaller than when the old formula is employed.

2. A still better method depends upon the addition of 5 Cc. of a 20 per cent. solution of potassium ferrieyanide. The author proposes the following method: Use 2.5 Cc. of urine, 1.5 Cc. of 20 per cent. solution of potassium ferrieyanide and then 20 Cc. hypobromite solution which contains in 1 liter, 400 Gm. NaOH, and 100 Gm. Br.—Suedd. Ap. Ztg., 1913, No. 79. (O. R.)

**Urea.**—*Confirmative Proof of Its Presence in Plant Juices.*—R. Gosse observes that while the presence of urea in a number of plants has been previously recorded, objection may be taken to its source, since it might have been formed during the experiments recorded by the action of heat or reagents on certain albuminoid constituents present, so that the possibility of its being a factitious substance has not, hitherto, been absolutely precluded. In a recent series of experiments, repeated on the same and additional organs of plants of many different species, the author entirely obviates this objection, and eliminates all cause of error from extraneous sources. By employing xanthidrol as the precipitant it has been possible to precipitate urea in the form of dixanthyl urea directly from the plant juices and macerations themselves, in the cold. Xanthidrol is an extremely sensitive precipitant of urea. Under these conditions all that has been necessary has been to add it, in solution in acetic acid, to the expressed juice or aqueous maceration, also rendered acid with acetic acid, and previously clarified by filtration. The crude

dixanthyl urea was then separated by centrifugation after standing in the ice chamber for twenty-four hours. The precipitate was washed with alkali and water, recrystallized from boiling alcohol or from pyridine, and its melting point,  $261^{\circ}\text{C}$ ., determined. In this way no conceivable alteration can have occurred in the constituents or tissues present. The urea obtained must have pre-existed, as such, in the material examined. A list is given of about thirty plants, fodder material and culinary vegetables, which have thus given by this test confirmatory positive proof of the existence of urea in their juices.—*Pharm. Journ. & Pharmacist*, July 26, 1913, 113; from *Compt. rend.*, 156 (1913), 1938.

**Uric Acid.**—*Estimation in Blood.*—Dr. Ziegler recommends the following process for estimating uric acid in blood: To 10 Cc. of the serum, 10 Cc. of a 4 per cent. solution of sodium hydroxide, 20 Cc. of a 5 per cent. solution of  $\text{NaHCO}_3$ , 10 Cc. of a neutral 3.5 per cent. solution of sodium sulphite, and 20 Cc. of water are added, and into this mixture, with constant rotation, 10 Cc. of a 2.5 per cent. solution of cupric sulphate are dropped from a pipette. A splendid, blue-violet, perfectly clear liquid results, which is heated to boiling for exactly  $\frac{1}{4}$  hour, which reduces its original volume to about one-third, and the uric acid is completely deposited in combination with cuprous oxide in form of gray-white flocks. The liquid with the sediment is next centrifuged, the sediment being washed with water, dissolved in 10 Cc. of conc.  $\text{H}_2\text{SO}_4$ , and titrated with standardized solution of potassium permanganate.—*Pharm. Ztg.*, lviii (1913), No. 49, 483; from *Münch. Med. Wschr.*, 1913, No. 20.

**Urine.**—*Identity of the Substances Forming Indigo.*—R. V. Stanford observes that it has long been known that human urine contains a substance which yields indigo, but the identity of this has not yet been established. Since potassium indoxysulphate occurs in the urine of animals which have been fed with indole, it is assumed that this salt is the origin of the indigo which may be obtained from human urine. The author, after experiments with 2,000 samples of urine, does not hold this view. He considers that the indigo-forming matter is not a single substance, but a mixture of bodies allied to the indigo group. He finds it to be extremely unstable; the quantity present in urine diminishes notably in one to three hours, and in three to six hours it disappears almost totally. Occasionally it remains for a day.—*Apoth. Ztg.*, xxviii (1913), 791; from *Ztschr. Physiolog. Chem.*, 87 (1913), 188.

**Urine.** *New Indican Reaction.* Prof. Dr. Adolf Jolles reported the following before the 85th annual convention of the German Naturalists in Vienna: 10 Cc. of urine are precipitated and clarified with 2 Cc. of 20 per cent. solution of lead acetate. To this filtrate, add 0.5 Cc. of 10 per cent. alcoholic solution of thymol, 10 Cc. of Obermayer's reagent, and 4 Cc. of chloroform. Upon agitation even the very minutest quantity of indican is proven by the violet coloring of the chloroform. Upon agitating the chloroform layer with water, the color will become yellowish brown to reddish brown, but upon addition of concentrated hydrochloric acid, the violet color will again develop.—Suedd. Ap. Ztg., 1913, No. 79. (O. R.)

**Urine.** *Convenient Method of Estimating Albumen.* Frank R Eldred and C. M. Pence observe that the determination of albumen in urine by weighing the precipitated albumen or by determining its amount by the Kjeldahl method, requires so much time that it is not adapted to the needs of the clinician. Several methods have been devised for its approximate determination, depending upon the measurement of the volume of a precipitate after centrifuging or allowing to stand; but, upon trying these methods they were found to give results so unreliable as to be of little value. The authors, as a result of experiments explained, however, find the following method to give serviceable and reliable results for the purpose mentioned:

Filter the urine if cloudy and measure 1 Cc. from a pipette or burette into a 5 Cc. graduated test-tube having an internal diameter of 9 Mm. Dissolve about 0.04 Gm. of monobasic sodium phosphate in the urine and fill the test-tube to the 4 Cc. mark with a mixture of 98 volumes of acetone and 2 volumes of glacial acetic acid, both of U. S. P. quality. Close the test-tube with a stopper, invert slowly six or seven times and then shake vigorously for thirty seconds. Allow the test-tube to stand in a vertical position for exactly fifteen minutes; read off the volume of the precipitate and determine the percentage of albumen by reference to the following table:

Cubic Centimeters Precipitate.	Per cent. Albumen.	Cubic Centimeters Precipitate.	Per cent. Albumen.
0.20	0.09	0.75	0.91
0.25	0.13	0.80	1.01
0.30	0.17	0.85	1.10
0.35	0.22	0.90	1.19
0.40	0.29	0.95	1.29

Cubic Centimeters *	Per cent. Albumen.	Cubic Centimeters	Per cent. Albumen.
Precipitate.		Precipitate.	
0.45	0.37	1.00	1.38
0.50	0.45	1.05	1.48
0.55	0.54	1.10	1.59
0.60	0.64	1.15	1.72
0.65	0.73	1.20	1.86
0.70	0.82	1.25	2.05

If more than 1.25 Cc. of precipitate is obtained, dilute the urine with an equal volume of water and make a new test, using 1 Cc. of the diluted urine, and multiply the percentage found by two. The results are not influenced by ordinary variations in temperature, nor by the changes in acidity or the amount of phosphates caused by the varying composition of different urines. Obviously, however, considerable variations in the diameter of the measuring tube, or in the manner of mixing the liquids do affect the result. The specifications should therefore be rigidly adhered to.—Journ. A. Ph. A., February, 1913, 154-155.

**Urine.**—*Determination of Glucose.*—C. K. A. Nonhebel reports on urine with a sp. gr. 1.032, of a very dark color, and of a strongly acid reaction. Albumen was not present and no reduction took place with Fehling's and Nylander's reagent. However, by fermentation and also by polarization, 0.25 per cent. of sugar was found. The urine after standing 24 hours formed a large precipitate and was reduced when 9 Cc. were boiled with 1 Cc. of Nylander's reagent. The author concludes that the reaction was prevented, owing to the presence of an excessive amount of uric acid, which combined with the alkali of the reagent. In cases of this sort, it is advisable to dilute the urine with water, until the sp. gr. of normal urine is reached.—Ph. Zhalle., 1913, No. 41. (O. R.)

**Urine. Sugar Test.**—W. E. Home observes that in testing urine for sugar, the usual plan is to add a few drops of urine to the freshly boiled Fehling solution, and then boil. The author finds that if the urine be poured from a pipette on to the surface of the Fehling solution just boiled, and the tube be set up for a minute in the test-tube rack, he gets a sugar reaction to manifest itself from glucose solutions too dilute to precipitate copper oxide when the test is done in the usual way. The oxide forms at the interface and in the urine, where there is little caustic alkali or tartrate to dissolve it. Pharm. Journ. & Pharmacist, March 15, 1913, 367; from Lancet, March 8, 1913, 719.



**Urine.**—*Estimation of Sugar.* Several years ago Ivar Bang devised a method for the estimation of sugar in urine, which depends on the fact that in the presence of potassium sulphocyanide the cuprous oxide formed is retained in solution in the form of colorless cuprous sulphocyanide, and the excess of cupric oxide is then estimated by means of hydroxylamine. The author has now revised the method by substituting a concentrated alkaline KCl solution in place of the sulphocyanide, and titrating the cuprous oxide, which is retained in solution as  $\text{CuCl}$ , direct with iodine V. S. The new method, however, requires great care. Explicit directions are given (in the original) both as regards the execution of the method, and the preparation of the reagents and solutions required.—Pharm. Ztg., lviii (1913), No. 31, 311; from Biochem. Ztschr., 49 (1913), Nos. 1 and 2.

**Urine.**—*Convenient Detection of Iodine.*—Dr. R. Ehrmann recommends the following method for the detection of iodine or its compounds in urine: To 2 Cc. of the urine, about 0.5 to 1.0 Cc. of hydrochloric acid and about 0.5 Cc. of 3% hydrogen dioxide (or 0.5 Cc. of ordinary ferric chloride solution) are added. The liberated iodine is then extracted with 1 Cc. of toluol, which separates on the surface as a red layer, or with 1 Cc. of chloroform, which sinks to the bottom of the test-tube as a deeper red layer.—Pharm. Ztg., lviii (1913), No. 64, 630; from Berl. klin. Wschr. 1913, No. 30.

**Urine and Saliva.**—*Convenient Test for Iodine.*—F. Lesser, with the end of a match, stirs a little calomel into a few drops of the urine on a slide or card. If it contains iodine, the calomel turns bright yellow. Iodine in the saliva is shown up in the same way, if the patient spits on a little calomel. This calomel test, he says is extremely delicate and reliable. Another way to reveal the presence of iodine is by touching the tongue with a silver nitrate stick. The white mark left by the caustic is not white but yellow in case the individual has been taking iodine. (Berl. klin. Wschr., v. 50, No. 44.)—J. Am. M. Assoc., 1913, v. 61, 2198. (M. I. W.)

**Urine.**—*"Original" Method of Testing for Potassium Iodide.* Henry Power describes an original method of testing for potassium iodide in the urine which requires: A, boiled starch solution; B, a small platinum or carbon electrode; C, any convenient source of direct electric current; D, a white evaporating dish. Test:—

Urine is mixed with starch solution and the dish and the two electric poles immersed in the fluid, the positive or carbon pole being platinum or carbon. A current of from 3 to 10 milliamperes is allowed to flow through the liquid mixture and in a few seconds the starch about the positive pole is seen to turn blue as a result of the iodine set free from combination by the action of the current.—J. Am. M. Assoc., v. 60, 1621. (M. I. W.)

**Urine.**—*Estimation of Mercury.* W. Beckers publishes a critique of the several suggested assays of small quantities of mercury in urine, with particular reference to Schumacher-Jung's (Ztsch. f. analyt. Chemie, 1902, No. 8) criticism of Farup's method. After describing this method, and Schumacher-Jung's modification of same, Beckers publishes his results of parallel assays of several samples of urine by both methods and reports that they agree quite well and that the Schumacher-Jung method seems no better than the older Farup assay. Each of these assays are based on the reduction of the soluble mercury compound in urine to metallic mercury (with stannous chloride) and eventual collection and weighing of the mercury as amalgam on gold-coated asbestos.—Arch. d. Pharm., 251 (1913), No. 1, 4. (H. V. A.)

**Bile-Coloring Matters.**—*Detection in Urine and in Blood.*—Dr. Pakuscher and Dr. Gutmann have elaborated a new process for the detection of bile-coloring matters in urine and in blood, and recommend the following manipulation suitable in each case:

**For the Detection in Urine,** about 5 Cc. of the sample are vigorously shaking in a test-tube with 1 Cc. of a 0.5 per cent. ethereal solution of iodine; two layers are formed, the upper containing the excess of iodine in ether, the lower consists of a green to green-blue aqueous liquid. The mixture is shaken out with ether to remove the excess of iodine until the ether layer is nearly or entirely colorless, whereupon the aqueous layer will assume a distinct green color if bile pigment is present in the urine.

**For the Detection in Blood,** 2 Cc. of the blood serum are shaken with 3 Cc. of absolute alcohol and then filtered to remove precipitated albumen. The filtrate is acidulated with 0.3 to 0.5 Cc. of 25 per cent. hydrochloric acid, 2 Cc. of distilled water are added, then about 0.5 Cc. of a 0.5 per cent. ethereal iodine solution, and the mixture shaken several minutes. As in the previous case, the excess of iodine is removed by shaking out

with ether, whereupon the lower aqueous layer separates as a distinctly green or green-blue liquid if bile pigment is present, but in the absence of the latter is absolutely colorless. Pharm. Ztg., lviii (1913), No. 49, 483; from Med. Klin., 1913, No. 21.

**Biliary Coloring Matters.**—*Detection in Urine.* C. T. Reichardt communicates the results of examination of a urine, which confirm the observation previously made that Gmelin's reaction for biliary chromogens becomes indistinct in urine rich in coloring matters and may under circumstances fail completely. In the present case the coloring matters of the urine containing chromogens in abundance fail to react completely with nitric acid. Only after the action of air and light, presumably also of bacterial activity, the bilirubin was oxidized to biliverdin on the one hand, and, on the other hand, the chromogens and indigo compounds were reduced, so that the biliary coloring matters were easily recognized.—Pharm. Ztg., lviii (1913), No. 60, 591.

**Urobilin.**—*Detection in Urine.*—Dr. Th. Hausmann recommends the method originally proposed by Bogamaloff as being the best for the detection of urobilin in the urine. According to this 10 to 20 Cc. of the urine are mixed with 20 to 40 drops of a 10% solution of copper sulphate by rotating the test-tube; 2 to 4 Cc. of chloroform are then added, and the mixture is rotated about ten times, taking care to avoid shaking. The chloroform collects on the bottom of the tube and exhibits a light yellow to dark yellow color according to the quantity of urobilin present. In the case of alkaline urine the color of the chloroform inclines towards a rose-red. If urobilinogen is present, this is quickly converted by the copper salt unto urobilin. The method is applicable also to the quantitative determination of the urobilin.—Pharm. Ztg., lviii (1913), No. 21, 210; from D. Med. Wschr., 1913, No. 10.

**Urobilinogen.**—*Quantitative Determination in Urine.*—Dr. Platon and Brünell propose a new method for the quantitative determination of urobilinogen in urine, which is based on the property of the urobilinogen to yield with *p*-dimethylamidobenzaldehyde a handsome coloring body, but differs from the method of Charnas in being a colorimetric instead of a spectrometric method, comparison being made with a standard alkaline solution of phenolphthalein by means of the colorimeter of Autenrieth and Koenigsberger.—Pharm. Ztg., lviii (1913), No. 21, 210; from Münch. Med. Wschr., 1913, No. 5.

**Metals in Human Liver.**—*Method of Assay.*—Van Itallie and Van Eck report a study of the assay of liver for arsenic, copper and zinc. They find the best method of destroying the organic material is that of Kerbosch in which 200 Gm. finely cut liver is put into a tubulated retort of Jena glass and then treated first with a mixture of 25 Cc. concentrated sulphuric acid and 25 Cc. nitric acid (sp. gr. 1.3) and then after charring and frothing is over, nitric acid is dropped into the warm mixture until a faint yellow or colorless liquid results. After distilling the sulphuric acid from this until only 5 to 10 Cc. fluid remain, this is diluted with water and assayed for arsenic by Marsh's test; for copper by precipitation as copper sulphide and eventual colorimetric copper estimation (with ammonia or with potassium ferrocyanide); for zinc by precipitation as sulphide and final weighing as oxide. By such process, analysis of livers of 24 cadavers ranging from still-born infants to aged persons were analyzed with results showing that arsenic is not a normal constituent; that copper is found in amounts ranging from 2.9 Mgm. to 30 Mgm. per kilo of liver; that the normal zinc content runs from none to 86.8 Mgm. per kilo.—Arch. d. Pharm., 251 (1913), No. 1, 50. (H. V. A)

## ADDENDUM

*Abstracts from certain American Journals mentioned in the "Introductory," classified and arranged in alphabetical order as there described.*

### PHARMACY.

**Blueberry Juice.**—*Use as an Indicator.*—G. N. Watson, of the Drug Laboratory, University of Kansas, suggests the availability of the juice of the common blueberry, *Vaccinium corymbosum*, as an indicator in volumetric analysis. This juice imparts a greenish blue color to alkaline media, but turns to a beautiful rose color by acids. He finds that on adding a few drops of the neutralized juice to the liquid under examination, a very delicate color reaction occurs, changing from an olive-green in alkaline to the rose color in acid solution. Volumetric solutions, ranging from N 1 to N 50, were tried and the color change was found sensitive to one drop of the latter solution. It is sensitive to carbonic acid and, as in the case of litmus, the solution of carbonate must be boiled.—Amer. Jour. Pharm., June, 1913, 246.



**Boiler with Strainer.** *A Handy Combination.*—Daniel M. Grosh, when small lots of material have to be boiled and the liquid strained off, uses a boiler closed with a lid punched full of holes. When the liquid is ready to be strained, the whole outfit is turned upside down over the receiving vessel, the lid acting a strainer.—*Drugg. Circ.*, September, 1913, 505.

**Emulsion of Cod-Liver Oil ("Black Bottle").**—*Palatable and Sweetened without Sugar or Saccharine.*—Robert Albro Newton gives the following formula for an emulsion of cod-liver oil which has long been popular in New England as the "Black Bottle," in which the taste of the oil is disguised by licorice and spirits of lavender and peppermint. The manipulation is that of the official cod liver oil emulsion:

Powdered acacia.....	13 drachms
Cod-liver oil.....	6½ ozs.
Flavoring oils (see below).....	15 minims
Pure extract of licorice.....	5 drachms
Glycerin.....	2½ ozs.
Water to make.....	1 pint

Mix in a dry mortar the cod-liver oil, flavoring oils and acacia. Add all at once 3¼ ozs. of water and triturate rapidly till emulsified. Dissolve the extract of licorice in 2 ozs. hot water, cool and strain through cheese cloth, add to emulsion followed by the glycerin and enough water to make one pint.

The "Flavoring Oils" for the above are made as follows:

Oil cassia.....	1 oz.
Oil lavender.....	4 drachms
Oil clove.....	1 drachm
Oil peppermint.....	½ drachm

Mix, and use 15 minims for one pint of the emulsion.—*The Apothecary*, March, 1913, 24.

**Filter Paper (Swedish and Others).**—*Manufacture and Quality.*—Thomas J. Keenan, Editor of "Paper," and an authority, writes interestingly on the manufacture and quality of Swedish filter paper, and, incidentally, describes the filter papers in ordinary use, pointing out their adaptability to the purposes of pharmacy and of general use, their specific use, and their inferiorities. Space forbids that the method of manufacture of the Swedish filter paper considered the most reliable for analytical purposes, although other good brands are in competition—should be brought here, and the author's paper must therefore be con-

sulted for this and other interesting information—*Pract. Drugg.*, August, 1913, 25-26.

**Fluidextracts.**—*Preparation by a New (?) Method of Extraction.*—E. H. La Pierre circumstantially describes a method of extraction adapted to the retail pharmacist for which, it is true, he makes no claim for originality, but which is essentially the process of "Fractional Percolation," described on page 58 of the "National Formulary," 3d Edition, the proportions being however not exactly defined, while, on the other hand, the details of manipulation are more voluminous. It is singular that the author failed to direct attention to this process. *The Apothecary*, October, 1913, 26-27.

**Acetic Fluidextract of Digitalis.** *Therapeutic Inferiority.*—A lot of acetic fluidextract of digitalis (containing about 15 per cent. of acetic acid) having been returned with the statement that "it was of unsatisfactory physiological activity," W. A. Pearson investigated the cause of the alleged inferiority, the records showing that the preparation had been made the year previous from digitalis leaves which he had previously tested and found to be of satisfactory physiological activity. A series of comparative physiological experiments were therefore made with this fluidextract on eight different guinea pigs, using different quantities and dilutions, and on three others with freshly prepared acetic fluidextract, and on three pigs with a fluidextract prepared by the U. S. P. method—both fluidextracts being made from the same lot of digitalis leaves. The results, which are given in detail, prove that the physiological activity of acetic fluidextract of digitalis is undoubtedly markedly less than that of the fluidextract made by the U. S. P. method and that in all probability the glucosides of the drug are promptly broken down by the acetic acid.—*Amer. Jour. Pharm.*, June, 1913, 245-246.

**Galenicals.**—*Decomposition by Storage in White Glassware.*—F. T. Gordon observes that many galenicals are known to deteriorate on keeping, this being usually ascribed to instability inherent to them, losing strength, precipitating, or simply changing color. Exposure to heat and light and air are important factors, fermentation and bacterial action are others, but one cause seems to have been overlooked or underestimated, the excessive alkalinity of much of the white glassware used as containers. Years ago he began the study of the effects of excessive alkalinity of glassware

on liquids kept in such containers, and repeated experiments and investigation of many cases of deterioration have convinced him that this is often the cause of much trouble. Recalling experiments made some years ago on deteriorations of spirit of nitrous ether, in which he found that exposure to light and heat in different kinds of bottles under identical conditions gave such varying results that he looked for another cause, and found that certain bottles whose contents showed the greatest loss in strength were made of glass that yielded considerable quantities of alkalis to solutions kept in them—in one case, an 8 oz. white glass bottle converting as much as one-fourth the ethyl nitrite content into alkali nitrite in the course of three months. Green glass bottles also showed marked decomposition. The reaction, the author believes, is dependent on the amount of soluble alkali in the external surface of the glass, some samples showing deteriorations in a few days, others gradually, as if the alkali were being liberated from the glass at the rate at which it is combined with the nitric radicle. The remedy is to manufacture glassware which is practically free from soluble alkali or soluble alkali silicates. If such cannot be obtained, ordinary glassware can be made temporarily free from soluble alkali by boiling in a dilute solution of  $\text{H}_2\text{SO}_4$  for about an hour, allowing to remain in the bath until it is cool, and thoroughly rinsing the bottles before they are used.—*Amer. Drugg.*, February, 1913, Index page 48.

**Gelatin Capsules.**—*Practical Hints for Filling.*—Paul Caldwell says that there is room for improvement in the method usually observed in filling capsules. The rules which should govern the dispensing of them are few, but none the less important. The first rule to observe is cleanliness. Perspiring finger tips collect the powder and make it stick so that the capsule cannot, without difficulty, be wiped clean. This is avoided by dipping the fingers into a drying powder when they show a tendency to moisture and the capsules will wipe cleaner than if they are sticky. Another important rule is that the capsule should only be filled on one side. If this rule is neglected, the capsule is longer and consequently swallowed with more difficulty than if a larger capsule is used and only one end filled; moreover, the longer capsules frequently become disjointed and the contents spilled in the box. It is important also to know the exact capacity of the capsule and the weight of the medicament which it will hold, this varying for the same volume capacity according to the particular medicament. The author submits a table showing these

relations of volume capacity to weight capacity embracing a large number of drugs which are fairly representative of those required in prescription work, which must be consulted in the original paper, together with the specific information for carrying out the method recommended.—*Drugg. Circ.*, April, 1913, 188-189.

**Gelatin Capsules.**—*Modern Improvements in Manufacture.*—Daniel M. Grosh says no branch of manufacturing pharmacy has been so completely revolutionized as has gelatin work in capsule making and pill coating, and no branch has called to its aid the mechanical assistance as has this work. All the developments have taken place within the past decade, and the makers have installed specially designed machines along with the help of steam, electricity, compressed air, the vacuum, and hydraulics. The application of these to making of soft and hard capsules, incidentally also of gelatin-coated pills, together with the material employed and the general process, are described. Only the finest French gelatin is employed, which gives the best results.—*Merck's Rep.*, March, 1913, 57.

**Mucilages of the U. S. P. and N. F.**—*A Plea for Their Retention and, Possibly, Augmentation.*—Presuming that in the present revision of the U. S. P. most of the mucilages will be deleted, and N. F. mucilage also, simply because they are no longer popular with present-day prescribers, Professor Philemon E. Hommell regards such action, if taken, to be a mistake. After some investigation, which he explains in a review of the formulas which have been official, or in use, he has reached the firm conclusion that they should be retained, if not in the U. S. P., at least by the N. F. Indeed, it will be well to place them all there, and instead of omitting any of them to increase their number; for the mucilages possess, without doubt, intrinsic value from a pharmaceutical, medical, and dietetic standpoint, as he plainly shows in his critical review. He suggests that the N. F. should contain the following mucilages, properly classified, and also briefly stating their pharmaceutical uses, medical properties and dietetic value: Dextrin, salep, chondrin, cydonium, acacia, tragacanth, ulmus, cetraria, lini, and amyli.—*Merck's Rep.*, Jan., 1913, 12-13.

**Ointments.**—*Practical and Historical Observations.*—Jennie M. White contributes some interesting observations concerning ointments and their preparation, directing attention to difficulties encountered in making them, and describes methods by



which they may be overcome or corrected. She delves also into the history of ointments, showing them to be among the most ancient of medicaments employed in the treatment of disease, and speaks interestingly, among others, of basilicon, citrine, diachylon, and refrigerant ointment—the latter our well-known "Cold Cream." The paper should be consulted in the original. *Merck's Rep.*, Jan., 1913, 13-14.

**Peroxide Tooth Powder.**—*Formula.*—Robert Albro Newton gives the following formula for a peroxide tooth powder:

Peroxide of magnesium (No. 200-inch sieve) . . . . .	60 parts
Perborate of sodium . . . . .	30 parts
Pulverized soap . . . . .	10 parts
Flavoring . . . . .	to suit

Tested with the latest method of brushing for ten minutes, this powder produces no loss of enamel.—*The Apothecary*, March, 1913, 24.

**Powder Moistener.**—*A Simple Device for Quickly Making Granulations.*—Daniel M. Grosh uses for moistening powders preparatory to granulating them, a percolator fitted with a cork and tubing of sufficient length, with a small sprinkler and compression spring on the tubing, this apparatus being suspended over the powder. The quantity and flow of the liquid for moistening may by this device be regulated, thus allowing both hands to be used for working the material.—*Drugg. Circ.*, September, 1913, 505.

**Receivers for Percolates.** *Convenient and Cheap Construction from W. M. Packers.*—Although not new, Wm. Mittelbach gives explicit instructions for cheaply constructing graduated receiving bottles (in wine and metric measure) from ordinary w. m. packers. A line is scratched on the bottle its full length; on this, scratch marks and figures indicating pints, quarts, and fluid ounces on one side, and cubic centimeters on the other. Of course the method is adapted for receivers of smaller sizes.—*Drugg. Circ.*, October, 1913, 615-616.

**Soaps.** *Simple Methods of Testing.*—F. T. Gordon describes in some detail a number of simple methods of testing soaps which are adapted for the pharmacist who is unable to apply the more complete tests of the thoroughly equipped chemist. The paper, which cannot be conveniently condensed, should be consulted in the original. *Amer. Drugg.*, March, 1913, Index page 80.

**Suppositories.**—*New Method of Making and Dispensing.*—Roman E. V. Angresius describes a new method of making and dispensing suppositories, which depends on providing a gelatin coating whereby the mass is protected from melting and the making and dispensing greatly simplified. The essential features of the author's invention are a gelatin shell with a removable closure and a means for ripping the shell from the body of the suppository. The top is removed from the capsule, the grated cacao butter mixed with the required medicament, and introduced dry just as quinine is put into capsules; or, if some liquid is required, a mass is formed and introduced in that form, whereupon the cover is put on and the suppository ready for dispensing. When the suppository is to be used, it is placed in water for one-half to one minute to soften the gelatin capsule, which is then ripped by pulling a string attached on the interior, and the capsule removed, ready for use. The paper is illustrated by figures showing the several parts and operations in detail.—*Amer. Drugg.*, December, 1913, 429-430.

**Thermometer for Liquids.**—*Construction from a Tin-Cased Thermometer.* To obtain a useful and cheap thermometer for liquids, Wm. Mittelbach selects an ordinary tin-cased thermometer, graduated in C. and F. degrees, removes the scale plate with thermometer tube attached, and "amputates" a part of the scale plate below the mark 32° F. (0° C.). He has found this both convenient and useful in many operations; so, for example, in making citrine ointment.—*Drugg. Circ.*, October, 1913, 616.

**Tincture of Iodine.**—*Commercial Variation of Components.*—In a paper read before the Washington Branch of the Association, Dr. Lyman F. Kebler says that tincture of iodine has probably been more frequently examined than any other commodity offered for sale by the retail drug trade, and that he knows of no medicinal agent which has been more frequently found wanting. The pharmacopœial tincture contains "about 6.86 Gm. of free iodine and 5 Gm. of potassium iodide in 100 Cc. The range of variation shown in a table accompanying the paper, embracing 50 commercial samples of the tincture, shows a range of variation of (free iodine) from 1.97 to 9.26 Gm. per 100 Cc. This, he says, is certainly remarkable: What real valid excuse can be offered for either of the above extremes? Furthermore, is there any substantial reason for some of the other variations? The permissible variation from the standard must be met sooner or

later. Shall it be stringent or reasonable? If reasonable, shall the variations be 5 per cent. or 10 per cent. or 20 per cent.? The author invites suggestions, the variations in the alcohol and potassium iodide content being also taken into consideration—the latter having been found to vary from nothing to 6.82 Gm. in 100 Cc. Amer. Jour. Pharm., April, 1913, 153-155.

**Tooth Paste.** *Formula.*—Dr. Wells gives the following formula for a tooth paste: Precipitated chalk, 8 ozs.; powdered castile soap, 1 oz.; sodium benzoate, 1 drachm; saccharin, 4 grains; oil of wintergreen, oil of peppermint, oil of clove, and oil of cinnamon, of each, 15 minims; menthol, 5 grains; thymol, 5 grains; zinc sulphocarbolate,  $1\frac{1}{2}$  drachms; glycerin, a sufficient quantity to make a mass. —The Apothecary, August, 1913, 28.

**Wild Cherry Bitters.** *Formula.*—Robert Albro Newton gives the following formula for Wild Cherry Bitters:

Wild cherry bark.....	8 ozs.
Yellow cinchona bark.....	1 oz.
Orange peel.....	2 ozs.
Cardamom seed.....	1 oz.
Canada snake root.....	$\frac{1}{2}$ oz.
Honey.....	16 ozs.
Simple syrup.....	16 ozs.
Diluted alcohol, sufficient to make.....	128 fl. ozs.

Percolate the drugs in moderate fine powder with diluted alcohol and when 96 fluid ounces are obtained, add the honey and syrup.—The Apothecary, March, 1913, 25.

#### MATERIA MEDICA.

**Agar-Agar** (Var. Sp., Fam. *Algæ*).—*Simple Method of Filtering.*—Michael G. Wohl describes a simple and rapid method of filtering agar-agar, and the necessary apparatus, as follows: The articles required are: (a) large tin funnel; (b) glass funnel of the same size; (c) cork to fit into the neck of the tin funnel; (d) Bunsen burner; (e) cork borer and water; (f) plaited paper filter. A hole is bored in the cork of suitable size to fit the stem of the glass funnel snugly at the neck. When inserted tightly into the tin funnel, a space is produced which is filled with water, which is then heated to boiling by applying the flame of the burner to the tin funnel. Two burners, the flame of one above the other, have the advantage of keeping the water uniformly hot. The filter having been inserted, the agar agar solution, previously strained through gauze to remove particles of coagulated albumen, is

poured on to it and filters rapidly.—Merck's Rep., March, 1913, 59; from Month. Cyclop. and Med. Bull., January, 1913.

**Asafetida** (*Ferula* Sp., Fam. *Umbelliferae*).—*Determination of "Lead Number."* J. R. Rippetoe observes that the "lead number" standard for asafetida and its application as a test for freedom from, or limit of foreign gum resins in passing this drug at the ports of entry, New York in particular, has been criticized by several well-known chemists, but the method (itself) for determining the "lead number" does not seem to have been as closely studied. In the spring of 1912 he had occasion to consider this method, the particulars having been given to him by Dr. Seil, of the Bureau of Chemistry, who stated at the time that asafetida had a "lead number" of 215 (later corrected to 222) by the method given, and that they were inclined to reject all importations with a number below 190.

In making some preliminary experiments upon selected tears of asafetida, Mr. Rippetoe found the values to vary as much as 66 upon the same sample, and similar observations were made by critics above referred to. Accordingly he puts forward the claim that the method is subject to too many variations to be relied upon for determining the "lead number" of either selected tears of asafetida or possible mixtures of asafetida and other gum resins, and in support of this claim communicates the details of a series of experiments undertaken with this purpose in view. The method was carried out as follows:

"The alcoholic solution of the alcohol soluble matter is evaporated on the water bath, the resin heated with water, stirring, then cooled (adding ice if resin does not separate) and the water decanted. The resin is dissolved in ether, transferred to a separator and washed with water until the water shows no turbidity. The ether solution is filtered into an evaporating dish and the solvent evaporated on a water bath. Weigh roughly about 1.1 Gm. of the above resin into a tared beaker and dry for 5 hours at 110° C., cool and weigh. Dissolve in 95 per cent. alcohol and transfer to a 100 Cc. measuring flask or cylinder, care being taken that not more than 70 Cc. of alcohol is used. Add 25 Cc. of a 1 per cent. lead acetate solution, make up to mark with 95 per cent. alcohol, mix thoroughly and set aside over night. Mix thoroughly and filter through a fluted filter; transfer 25 Cc. of the filtrate to a beaker, add 10 Cc. of water and evaporate to 10 Cc. on bath; add 5 Cc. of 10 per cent. sulphuric acid, and then



100 Cc. alcohol. Dissolve all separated resin and collect the  $\text{PbSO}_4$  on a tared Gooch crucible, ignite and weigh.

Run a blank in the lead acetate solution and calculate milligrams lead absorbed (weight  $\text{PbSO}_4 \times 0.6830 = \text{Pb}$ ) by 1 Gm. of the resin."

The lead acetate solution is prepared by dissolving 4 Gm. lead acetate in 20 Cc. of distilled water and sufficient 95 per cent. alcohol to make 100 Cc.

The method as recently announced calls for a 5 per cent. solution of lead acetate and 80 per cent. alcohol to dissolve the resin instead of 95 per cent., otherwise it is essentially the same.

The results of the author's experiments, which are shown in several tables, show that the lead absorption is subject to considerable variation. Several of the factors which seem to have more or less influence are: failure to obtain constant weight by drying at  $110^\circ \text{C}$ . for 5 hours, and the effect of the heat. The strength of the lead acetate solution and of the alcohol are within control. The use of 80 per cent. alcohol gives figures much below 222.—Amer. Jour. Pharm., May, 1913, 199-203.

**Belladonna and Hyoscyamus** (Fam. *Solanaceæ*).—*Culture Experiments in an English Herb Garden*. Francis H. Carr, giving a very lucid description of experimental work carried on during the past eight years at the Wellcome Materia Medica Farm, situated at Dartford, Kent, England, reports particularly on the methods pursued and the results obtained in the case of *Atropa belladonna*, and incidentally only with *Hyoscyamus niger*, during a period covering the past twelve months, but a brief review of other work—with *Scoparius* (Broom) and *Digitalis*—is also given. The land in which the experiments were made is situated on chalky hills and has a south aspect, some idea of the situation being given by photographic illustrations showing belladonna and hyoscyamus fields. The soil is light, permeable and chalky. In this, wild belladonna plants from various parts of England were propagated for two years, from which one strain, found to yield a high percentage of alkaloid and to give good growth, was selected and exclusively employed. These were set out and fertilized with different fertilizers—farmyard manure, sodium nitrate, calcium cyanamide, basic slag, superphosphate, kainite—during periods ranging from March to June, applied in definite quantities, and the percentage of alkaloid by titration in dry stem and leaf of the plants produced given in a table, which includes also the analyses of first-, second-, third- and fourth-year

plants (from 1910 to 1913, inclusive); the treatment during all these years being the same in quantity and kind of fertilizer. From the results obtained, the author is confident that in whatever latitude belladonna is grown, it will doubtless be found that the composition of the soil, the use of fertilizers, and seasonal conditions make for small variations. The statement sometimes made that the cultivated belladonna plant contains less alkaloid than that which grows wild, which is doubtless true of plants transported to a soil unsuited to them, is therefore not confirmed by the author's experience. Regarding

**Belladonna Root** of commerce, this varies greatly in alkaloidal strength—variations having been noted from 0.27 to 0.69 per cent. In order to determine whether this variation was due to collecting at different times of the year, roots from the same plot, derived from second year's plants which had been sown at the same time, were dug up at intervals (in 1911) and dried. The amount of variation was very small, the author's record showing: March, 0.56%; May, 0.59%; June, 0.53%; August, 0.50%; December, 0.59%—the only appreciable variation being that of the month of August, when the fruit is ripening.—*Amer. Jour. Pharm.*, Nov., 1913, 487-496.

**Cataphoresis (Iontophoresis).**—*Definition, and Application to the Art of Healing.*—F. A. Upsher Smith, after explaining briefly what is meant by "Electrolysis," defines its relations to the process of "cataphoresis," also known by the term "iontophoresis," for both of which, however, the term "ionic medication" would be a simple name, and easily understood. He says, the separation or splitting up of a chemical substance into its elements by electricity is known as "electrolysis;" the substance to be acted on is termed the "electrolyte." This must be fluid or semi-fluid and must necessarily be a conductor of electricity. When a substance is electrolyzed the products are termed "ions," a name coined by Faraday. The ions are electropositive or electronegative. Electropositive ions have a strong affinity for and pass to the negative pole of a battery, on the well-established law that "likes repel and unlikes attract." For the same reason the electronegative ions pass to the positive pole of the battery and are termed "anions."

The application of this process of electrolysis to the art of healing is termed "cataphoresis," "iontophoresis," and "ionic medication." It consists in the introduction into the body of suitable medicaments in the ionic state. The general rule for applying

drugs by cataphoresis consists in placing the medicament on the positive pole to utilize the base, and on the negative pole to utilize the acid. The author, emphasizing the necessity of extreme care, explicitly describes the proper method and the precautions to be observed in this application and gives much other information which should be consulted in the original paper.—*Merck's Rep.*, March, 1913, 60-61.

**Chicory** (*Cichorium intybus*, L., Fam. *Compositae*).—*Detection in Its Decoctions*. In a paper dealing with the detection of chicory in decoctions, Chas. H. LaWall and Leroy Forman mention that, while it is a comparatively simple matter to detect the adulterants in whole or ground coffee, because of the characteristic appearance of the tissues of both genuine coffee and its adulterants under the microscope, no satisfactory method has heretofore been presented by which the adulteration of the coffee could be proved after it has been made up into the beverage. It is possible, however, to prove adulteration in such preparations by inferential tests, even when the actual nature of the adulterant is not capable of positive identification, and such an opportunity exists as regards coffee and chicory in the prepared decoction. This depends upon the presence of the small amount of reducing sugars in coffees, ascertained by an examination of the extractive remaining on evaporating the decoction, and the very large amount in the extractive from chicory decoctions obtained in the same way. In experiments recorded, the maximum percentage of reducing sugars in the extractives, obtained from nine samples of roasted coffee of authentic origin, and covering all the important commercial varieties, was 2.64%, the minimum 1.92%, and the mean 2.29%; whereas the extraction obtained from two genuine specimens of roasted and ground chicory was 27.67 and 25.20%, respectively. Applying these values, ascertained as explained, the authors consider it safe to require that a coffee decoction, which contains more than 3% of reducing sugars in the extraction obtained under the conditions of the test, may be regarded as adulterated with chicory or some similar product. It is possible in this way to conclusively prove the presence of as small an amount as 5% of chicory in the ground coffee—smaller amounts being probably never used.—*Amer. Jour. Pharm.*, December, 1913, 535-538.

**Corallorhiza Odontorhiza**, Nutt. (Fam. *Orchidaceae*).—*Macroscopic and Microscopic Description of the Rhizome, Aerial Stem,*

and Leaf. Theo. Holm observes that the rhizome of *Corallorhiza* (sometimes spelled "*Coralliorhiza*") *odontorhiza*, Nutt., was formerly official, and was much valued by the eclectics as an energetic diaphoretic, destitute of general stimulant properties, and was given in fevers. He gives a description of the different vegetative organs of this (botanically) interesting plant, and describes in particular the macroscopic and microscopic characters of the rhizome, aerial stem and leaves, the text being illuminated by 16 figures, drawn from nature by the author. Merck's Rep., May, 1913, 120-122.

**Datura Stramonium**, L. (Fam. *Solanaceæ*).—*Macroscopic and Microscopic Description of the Root and Leaf*.—The drug yielded by *Datura stramonium*, L., consists of the leaf, official as "Stramonium," but all parts of the plant are medicinal. After a brief description of the drug, and mentioning its constituents and pharmacological uses, Theo. Holm gives a macroscopic and microscopic description of various organs of vegetation of the plant, in particular of the roots, the stem (hypocotyl), and the leaf, the text being illustrated by 16 figures drawn by the author from nature, and showing a flowering branch and the ripe fruit of the plant, natural size, followed by microscopic sections of the other organs of vegetation mentioned.—Merck's Rep., April, 1913, 87-91.

**Digitalis Purpurea**, L. (Fam. *Scrophulariaceæ*).—*Botany, Pharmacology, Chemistry, and Pharmacognosy*.—Prof. John Uri Lloyd publishes part of a treatise on digitalis in advance of its appearance in the "Lloyd Library Series" which will be consulted with interest. At the outset he deals with the localities in which the plant is native, the character of soil in which the plant flourishes or rejects its cultivation; the botanical characters of the first- and second-year plants; the pharmacognostic characters of the leaves. This is followed by a review of its chemical constituents, quoting largely Professor Dr. H. Kiliani's critical study (1874) of the "digitalins" of commerce, and concludes with a comprehensive historical review of the medicinal properties of the drug. The paper is illustrated by a number of admirably executed cuts, showing flowers and fruit, plants under cultivation, flowering plants of the second year, matured leaves of the first year's growth, and a pen drawing of a digitalis leaf, showing texture and ribs.—Amer. Jour. Pharm., May, 1913, 214-228.

**Digitalis Bodies**.—*Biological Standardization by the Cat Method of Hatcher*.—The more or less unfavorable criticisms of the cat



method recommended for the biological standardization of the digitalis bodies by Hatcher and Brodie (see Year Book, 1912, 183) has prompted Dr. Carey Eggleston, of Cornell University Medical College, to discuss these criticisms and to subject the method to an even more rigorous scrutiny, comparing it with some of the other and more widely used methods, to determine which of them is the most serviceable. The results of his comprehensive investigation, the details of which are given in a very voluminous paper, lead him to the following conclusions:

There is no perfect or ideal method of standardizing the members of the digitalis group biologically.

Each of the four methods discussed—the one-hour and the twelve-hour frog methods, the guinea pig and the cat methods—have certain advantages not possessed by the others.

The method which possesses the greatest number of advantages is the cat method of Hatcher:

- (a) It is accurate to within ten per cent.
- (b) It gives constant results from year to year.
- (c) It provides a means of detecting the presence of deterioration.
- (d) It is the least affected by adventitious factors.
- (e) It tests the action of the drug upon which its therapeutic use depends.
- (f) It is not too difficult for general use.
- (g) It is neither too time-consuming nor too costly.
- (h) By it widely different preparations can be compared accurately.
- (i) Its results can be compared to man.
- (j) It has the widest range of applicability of all the methods.

Neither the frog nor the guinea-pig method fulfill so many of the essential requirements as does the cat method.

The cat method fails in no single requisite and has far fewer disadvantages than any other method yet proposed. *Amer. Jour. Pharm.*, March, 1913, 99-122.

**Digitalis and Its Preparations.** *Observations on Their Keeping Properties.* Robert A. Hatcher and Carey Eggleston mention that the opinion is prevalent among both physicians and pharmacists that digitalis and its preparations undergo deterioration with considerable rapidity, and that certain manufacturers have made much of this belief in the claims put forth regarding the advantages of their specialties which, of course, are said not to be subject to such deterioration. The authors review at some length

the criticisms that have been made on this subject, both pro and con, by different observers of authority, who have described the causes for the deteriorations, if any, and how to prevent them—the general consensus of opinion being that age, moisture, light, and heat, alone or variously combined, according to the observer, cause marked and rapid deterioration in digitalis leaves and alcoholic fluid preparations. In spite of this opinion, however, the authors long since came to a contrary opinion, for they had observed that samples of powdered leaf which had been in the laboratory in cardboard containers for several years, and tinctures prepared from these leaves at different times in the past few years, retained their activity almost, if not quite, unimpaired. Stimulated by this apparent anomaly, they therefore undertook an investigation of the question of deterioration of digitalis and of its preparations, the very voluminous details of which are recorded in their paper, and from which they have drawn the following conclusions:

1. Commercial digitalis leaves of good quality do not undergo deterioration in many instances as the result of age; in a few cases they do appear to have deteriorated, but only with extreme slowness—at a rate probably not exceeding  $1\frac{1}{2}$  to 2 per cent. a year.

2. The same statement holds for pharmacopœial preparations made with a menstruum containing at least 50 per cent. of alcohol.

3. Heat below  $120^{\circ}$  C., applied for a reasonable length of time, does not cause deterioration in digitalis leaves, aqueous infusions, or alcoholic preparations, in the latter case even though the preparation be reduced to a soft extract.

4. The acetic fluidextract of digitalis is worthless.

5. Liquid digalen is decidedly inferior to alcohol-containing galenical preparations of digitalis in so far as permanency is concerned.—*Amer. Jour. Pharm.*, May, 1913, 203-214.

**Dioscorea Villosa**, L. (Fam. *Dioscoreaceæ*). *Diagnostic Characters*.—Theo. Holm mentions that formerly the rhizome of *Dioscorea villosa*, L., was used by the eclectics, and, incidentally, that it has long been known that the specific term "villosa" is misleading, since the plant is not villous in the stricter sense of the word. The eclectics considered the drug to be efficacious in bilious colic. After a botanical description of the plant, the author describes the macroscopic and microscopic features of the more important vegetative organs—the roots, rhizome, stem above ground, and the leaf, his text being illustrated by 30 figures drawn by him from

nature. These show: the rhizome with base of aerial shoots; part of aerial stem with leaves and staminate flowers all these of natural size; petiole of leaf showing the swollen base, magnified; and various other organs or parts thereof, some of natural size, others more or less magnified; the remaining sixteen figures exhibiting the microscopic fields of cross-sections of the more important vegetative organs above mentioned. Merck's Rep., December, 1913, 311-315.

**Epigæa Repens**, L. (Fam. *Ericaceæ*).—*Diagnostic Characters of the Vegetative Organs of the Plant*.—Theo. Holm mentions that in accordance with the investigations of Jefferson Oxley, *Epigæa repens*, L., popularly known by the names of Mayflower, Trailing Arbutus, Ground Laurel, and Gravel plant, contains arbutin, arson, ericolin and tannic, formic and gallic acids, and that it is highly recommended as a substitute for the closely related *Uva-ursi*, the active principles being identical. After a botanical description of the plant, he describes the principal vegetative organs, followed in particular by a macroscopic and microscopic description of the roots, the young stolons, the old aerial branches, and the leaves, the text being illustrated by 13 figures drawn from nature by the author—these embracing the flowering plant, natural size; a staminate flower; stamens and pistil of the same; a pistillate flower; the pistil and rudimentary stamens of the same, the apex of the style with the stigma; and magnified pollen grains, the remaining drawings showing the microscopic features of the parts examined in cross-sections. Merck's Rep., June, 1913, 144-146.

**Hydrastis Canadensis**, L. (Fam. *Ranunculaceæ*).—*Diagnostic Characters of the Roots, Rhizome, Aerial Stem and Leaf*. Theo. Holm gives a brief description of the drug hydrastis, consisting officially of the rhizome and roots of *Hydrastis canadensis*, L., the botanical characters of the plant, and the chemistry and medicinal properties of the drug. This is followed by a macroscopic and microscopic description of the rhizome, roots, over-ground stem and leaf of the plant, and the characteristic features of the other vegetative organs of the plant, the text being illustrated by 14 figures drawn from nature by the author, showing the rhizome of a mature specimen of the plant, the long secondary roots, and the stem with fruit and foliage, all of natural size, together with various of the vegetative organs, magnified, the last 8 of the illustrations showing the microscopic features of the parts specially mentioned in transverse section. Merck's Rep., August, 1913, 202-204.

**Hydrastis.**—*Cultivation.* John O. Baldwin contributes an interesting paper on the cultivation of *Hydrastis canadensis*, L., in which he notes some of the essential requirements necessary to the growth and development of this valuable plant. Describing his personal experience, he considers his subject under separate headings: Soil, Beds and Drainage; Enrichment; Plants and Setting; Artificial Shade; Mulching; Miscellaneous. Under the latter heading he gives some wholesome advice to those who propose to go into this venture, of which there is a goodly number. He says to them, "like unto the army who a few years ago undertook ginseng culture and failed, there is something to learn in this business before success is attained, (and) unless vital things are steadfastly followed in the growing of *Hydrastis*, ruin will be the result."—*Amer. Jour. Pharm.*, April, 1913, 148-153.

**Leptandra Virginica**, L.; Nutt. (Fam. *Scrophulariaceæ*).—*Macroscopic and Microscopic Description of the Rhizome, Rootlets, Aerial Stem and Leaf.* The official drug yielded by *Leptandra Virginica*, L., Nutt., is the rhizome with the roots, which Theo. Holm briefly describes in the language of the U. S. P., mentioning also its properties, constituents, and pharmacological uses. This is followed by a macroscopic description of the organs of vegetation of the plant, in particular of the rhizome with roots, the aerial stem and the leaf, the text being illustrated by 17 figures drawn by the author from nature. These show the rhizome with roots, the stolons, the buds, and the base of an aerial stem, natural size; specimens of a leaf from Virginia and one collected in Minnesota; various parts of the flowers and the fruits; the remaining five figures exhibiting the internal structure of roots, rhizome, aerial stem and leaf in microscopic cross-sections. — *Merek's Rep.*, March, 1913, 61-64.

**Menispermum Canadense**, L. (Fam. *Menispermaceæ*).—*Macroscopic and Microscopic Description of the Root System, Rhizome, Aerial Shoot and Leaf.* Theo. Holm briefly describes "*Menispermum*," the drug yielded by the rhizome and roots of *Menispermum canadense*, L., enumerates the chemical constituents, mentions its medicinal uses, and gives a botanical description of the plant. The macroscopic and microscopic elements of the organs mentioned in the heading are then described, the text being illustrated by 26 figures drawn by the author from nature. These show: the rhizome with internodes and the base of an aerial shoot, natural size; four different types of leaves, two-thirds of the natural



size; two seedlings (the primary root and the hypocotyl); the cotyledons; the first proper leaf, all these of natural size, the remaining sixteen figures showing in cross-sections the microscopic structure of the organs previously mentioned. Merck's Rep., November, 1913, 281-284.

**Pepper** (*Piper Nigrum*, L., Fam. *Piperaceæ*).—*Nitrogen Standard in the "Non-Volatile" Portion of the Ether Extract.*—The standards for black pepper as given in Circular No. 19 of the Bureau of Chemistry of the U. S. Department of Agriculture, provide that 100 parts of the non-volatile ether extract should contain not less than 3.25 parts of nitrogen, and for that of white pepper not less than 4.0 parts of nitrogen,—this requirement being intended to be a measure of the piperine in the ether extract. Professor Chas. H. LaWall's attention being drawn to the subject by being called upon to make some analyses of white pepper, his analyses confirmed the results of another analyst who found only 3.25 per cent. of N in the samples examined. In the case of black pepper also low results were obtained, but not proportionately so, only one being below the legal requirement. As a matter of fact, the requirement is one which is purely arbitrary and possibly subject to seasonal or other natural variations, or the time of collection. Prof. LaWall adds that, while piperine does constitute some pungency to both white and black pepper, it is (as a spice) the least valuable of the active constituents present, as all of the aroma and flavor, and much of the pungency as well, are contributed by the volatile oil and the resinous substances present. It would therefore seem as though this requirement should be modified or that some tolerance should be exercised by the analysts in the interpretation of results in rejection of samples on non-essential points.—*Amer. Jour. Pharm.*, June, 1913, 243-244.

**"Peyote"** (*Lophophora*, Fam. *Cactaceæ*).—*A Plant Used by Indians for Ceremonial and Medicinal Purposes.* R. I. Geare describes a small cactus (*Lophophora*) which is popularly known by the Indian tribes along the Rio Grande as "Peyote." It consists of a subterranean portion, resembling a radish in size and shape, surmounted by a button-like aerial portion, this "button" alone being used for ceremonial and medicinal purposes by the Indians north of the Rio Grande, along which it grows in the arid hills on both banks and southward in Mexico, where the whole plant is cut into slices, dried, and used in decoction, the ritual ceremony differing from that of the Northern tribes. The Kiowas call it

"señi," the Comanches, "wokowi," and the Tavalumares, "hikori" or "hikuli." The whites commonly call it "mescal," confusing it with the maguey cactus of the Southwest. The paper, which should be consulted in the original, is illustrated with figures showing the whole plant in two examples, with the protruding "button" attached, and a number of separated "buttons," such as are used by the Indian tribes north of the Rio Grande, to whom the drug is an object of great veneration, since it is regarded by them as the vegetable incarnation of a deity.—Merck's Rep., May, 1913, 109-110.

**Phylacogens.**—*What are they?* An inquiry addressed by the editor of the American Journal of Pharmacy to the promoters of the so-called "phylacogens" respecting the nature, properties and uses of this new form of bacterial derivatives, elicited an exceedingly voluminous response from which the following brief abstract may be interesting.

It appears from this that these bacterial derivatives, from the use of which extraordinary results have been reported in the treatment of acute and chronic infections, were originated by Dr. A. F. Schafer, of Bakersfield, California, who first presented his discovery to the profession through the San Joaquin Medical Society, at Fresno, Cal., in October, 1910. The principle upon which the use of these phylacogens (so named by Dr. Schafer by combining the two Greek words, *phulax* (a guard) and *gennan* (to produce), and meaning "phylaxin producer") is founded is, briefly, the theory of multiple infections. The principle is supported by an extraordinary practical experience, supplemented by exhaustive and long-continued laboratory and clinical experimental work by Dr. Schafer, who sets forth three facts as the basis of this new therapy:

First: Practically all acute and many of the chronic diseases are caused by the metabolic products of pathogenic bacteria.

Second: The human subject is the host of microorganisms that are pathologically latent but capable of setting up a disease process under certain conditions.

Third: The growth of infecting microorganisms can be arrested and their effects neutralized by products derived from their development in artificial culture media.

Phylacogens are neither "bacterial vaccines" nor "sera" as ordinarily understood. They are sterile aqueous solutions of metabolic substances or derivatives generated by bacteria grown in artificial media, and are made from a large number of species of the

well-known pathogenic bacteria, such as the several *Staphylococci*, *Streptococcus pyogenes*, *Bacillus pyocyaneus*, *Diplococcus pneumoniae*, *Bacillus typhosus*, *Bacillus coli communis*, *Streptococcus rheumaticus*, *Streptococcus erysipellatis*, etc. The various organisms are present in the material before filtration in approximately equal proportions. The cultures are incubated at 37° C. for 72 hours or longer, the bacteria killed, after which a preservative consisting of 0.5 per cent. of phenol is added to the fluid, which is then filtered through porcelain. The basic phylacogen, made in this manner, and used in the preparation of the several specific phylacogens, is named "Mixed Infection Phylacogen." This basic phylacogen is a "polyvalent" preparation, or "polyphylacogen," since the organisms are not from one strain only of a given species, but from cultures made at frequent intervals and from a variety of sources.

The remainder of this paper deals with the tests, potency, physiological action, clinical observations, etc., and ends with a bibliography covering 77 references. Amer. Jour. Pharm., July, 1913, 306-318.

**Poison Sumach** (*Rhus Vernix*, Fam. *Terebinthaceae*).—*Observations on the Pollen*.—L. E. Warren reviews at some length the literature dealing with the poisonous effects attributed to contact with the vegetation of certain members of the *Rhus* family—the poison sumach (*Rhus vernix*, L.) and the poison ivy (*Rhus toxicodendron*, L.), and particularly those that are attributed by observers to the pollen of the inflorescence of these plants. He finds that observers are by no means a unit on this question, some accepting and others denying that the pollen possessed these noxious qualities. He had himself long been skeptical concerning the poisonous properties of the pollen of these plants. Accordingly, the author collected during the past summer (1913) some of the pollen from the flowers of *Rhus vernix*, L., growing in Northern Indiana, and by physiological and microchemical tests, here briefly described, demonstrated that this pollen contained no poisonous constituent.

Some of the pollen which had been disengaged from the anthers of the flowers by shaking the flower stems (under certain precautions), was placed on a slide and examined with the microscope. When dry the pollen is in the form of orange-yellow, ellipsoidal grains. If moistened with alcohol or water the grains swell and assume a globular shape. The addition of a few drops of an alcoholic solution of KIO to the pollen grains on the slide produced no change of color. A small quantity of the pollen was macerated for several

hours in 95% alcohol, filtered, and the solution evaporated to a small volume. A portion of this was subjected to certain micro-chemical tests, which failed to reveal the presence of a poisonous resin. Another portion of the filtrate was allowed to evaporate spontaneously almost to dryness and a drop of the residue tested for poisonous properties according to the physiological method (slightly modified) described in Amer. Jour. Pharm., 1906, p. 63, by Tschirch and Stevens. This consists in thoroughly rubbing a drop of the suspected liquid into the integument of the forearm by means of a glass rod, covering a circular area of about 1 Cm. in diameter, washing the part with ether, then with alcohol, and lastly with soap and water. If poisonous, the area so treated will exhibit a noticeable redness and perhaps slight itching after 24 to 36 hours; if negative, the experiment is repeated, allowing the material to remain from one to two hours before washing it off; and if this fails, a third experiment through 24 hours is carried out.

When tested by this method upon four individuals, the alcoholic extract from the pollen of *Rhus vernix*, L., showed absolutely no poisonous properties.—Amer. Jour. Pharm., December, 1913, 545-549.

**Ranunculus Bulbosus**, L. (Fam. *Ranunculaceæ*).—*Diagnostic Characters of the Vegetative Organs*. Theo. Holm mentions that although many species of the genus *Ranunculus* have similar acrid properties, *Ranunculus bulbosus*, L., is the one that has been mostly used here. This is commonly known as "Bulbous Crowfoot," or "Buttercup." The whole plant, but chiefly the roots, of these species has a burning, acrid taste when fresh; it acts as a violent irritant, producing when chewed excessive inflammation in the mouth and throat, and, when swallowed, toxic gastritis which may prove fatal. After a brief botanical and chemical description, the author describes the macroscopic and microscopic features of the roots, stem and leaves of the plant, the text being illuminated by 13 figures which he has drawn from nature himself. These embrace an illustration of the plant with the tuber, root system and leaves; part of the inflorescence—both these natural size; while a petal, a stamen, and a carpel, are shown magnified. The remaining figures exhibit the cross-sections of various vegetative organs as observed under the microscope.—Merck's Rep., July, 1913, 178-180.

**Rhamnus Purshiana**, D. C. (Fam. *Rhamnaceæ*).—*Diagnostic Characters of the Root, Stem, and Leaf of the Plant*. Mentioning



that the drug "Cascara Sagrada" is the dried bark of *Rhamnus purshiana*, D. C., collected at least one year before being used, and giving a brief description of the plant and of the drug, its chemistry and medicinal uses, Theo. Holm describes the macroscopic and microscopic features of the root, the stem, and the leaf, illustrating his text with 16 figures, which he has drawn from nature. These show a branch of the plant with leaves and fruits, two-thirds of the natural size; part of flower laid open showing the calyx, petals, stamens and pistil in longitudinal section; a stamen surrounded by the petal, and hairs from the dorsal face of the petiole—all these being magnified, the hairs  $\times 320$ . The remaining eleven figures exhibit cross microscopic sections of the root, stem, branch, leaf and petiole.—Merck's Rep., September, 1913, 232-235.

**Rhubarb** (*Rheum* Sp., Fam. *Polygonaceæ*).—*Use in Place of Hydrastis as a Coloring for Liquids.*—Hydrastis is frequently used for its property of imparting a golden yellow color to liquid pharmaceutical preparations. John K. Thum says that for many years he has used this drug to give this color to the liquid antiseptic used in lieu of "Listerine," but the cost of hydrastis having become prohibitive, he found in rhubarb an excellent substitute. The coloring is obtained by macerating a definite quantity of ground rhubarb (3%) with alcohol for 24 hours and then percolating to a definite volume.—Amer. Jour. Pharm., January, 1913, 19.

**Robinia Pseudacacia** (Fam. *Leguminosæ*).—*Poisonous Constituent of the Bark.*—In the summer of 1889, Dr. Frederick B. Power obtained from the bark of *Robinia pseudacacia*, L., a protein substance, and in a paper published in the "Pharm. Rundschau," New York, in 1890, announced the fact that it possessed the well-known poisonous properties of robinia bark (see Proceedings, 1890, 489). In a subsequent paper published in 1901 (see Ibid., 1902, 877), in which he enters very thoroughly into the chemistry of robinia bark, Dr. Power had shown that this protein, to which in the meantime Professor R. Kobert, of the University of Rostock, had assigned the name "*robin*," possessed enzymic properties, and that it was capable of hydrolyzing both amygdalin and sinigrin (potassium myronate) with the production, respectively, of bitter almond oil and mustard oil, as also of clotting milk. Accepting the name "*robin*," for his enzyme, Dr. Power now directs attention to the fact that Prof. Kobert, utterly ignoring the priority of his (Power's) recognition of the poisonous nature of "*robin*," places the credit to one of his pupils, Dr. Carl Lau. But most astonishing

is the fact that in a recent publication, Prof. Kobert recedes completely from his previous concession that "robin" has poisonous properties, attributing any poisonous effects to the presence of impurities, probably the alkaloid or glucoside of the bark. In view of the conclusive proofs that he has given by his own investigations, and the importance of guarding against the confusion of misleading statements in the literature concerning a matter of such importance, Dr. Power, with his usual thoroughness and at some length, presents the recorded facts which appear to be incontrovertible, and insists that the observations noted in his previous publications respecting both the toxic action and enzymic properties of the protein ("robin") of robinia bark are perfectly correct.—*Amer. Jour. Pharm.*, August, 1913, 339-344.

**Saffron** (*Crocus sativus*, L., Fam. *Irideaceæ*).—*Modern Industrial Production*.—R. I. Geare interestingly describes the saffron industry as modernly conducted, giving details of the methods of cultivation, selection of seed (bulbs), localities of production, methods of treating the flowers, collection of the stigmata therefrom and their treatment to produce a satisfactory drug—the saffron being classified and graded by color and odor, by the length of the pistils and by the country where it is grown, the color chiefly sought being a brilliant, intense dark red. The value of the importations of saffron into the United States during 1912 was \$91,203.00.—*Merck's Rep.*, August, 1913, 197.

**Saponaria Officinalis**, L. (Fam. *Caryophyllaceæ*).—*Macroscopic and Microscopic Description of Root, Stem and Leaf*.—Theo. Holm describes the macroscopic and microscopic elements of the root (rhizome), aerial stem and leaf of *Saponaria officinalis*, L., the text being illustrated by 14 figures drawn by him from nature, showing the rhizome and its microscopic elements, the upper part of the stem of the plant with leaves and flowers, natural size, and the microscopic elements of the aerial stem and stolons, and the leaf. Incidentally, the author mentions that this species of *Saponaria* was already described as "*vulgaris*," by Camarius in 1586, and by Bauhin in 1671 as "*major lavis*." A brief account of the composition and uses of the drug is also given. *Merck's Rep.*, January, 1913, 9-12.

**Solidago Odora**, Ait. (Fam. *Compositæ*).—*Diagnostic Characters of the Root, and Rhizome, the Stem, and the Leaf*.—Mentioning that the leaves and tops of *Solidago odora*, Ait., were formerly

official under the name of "Solidago," and briefly also the properties and uses of the drug. Theo. Holm gives a botanical description of the plant, and describes the macroscopic and microscopic features of the rhizome, roots, stem and the leaf. The text is illustrated by 18 figures drawn by the author from nature, showing a rhizome with rootlets, the upper part of the stem with flowers, and a leaf, all of natural size, together with a number of other organs, or parts thereof, which are magnified the remaining ten figures exhibiting the internal structure of the organs specially mentioned in microscopic sections.—Merck's Rep., October, 1913, 252-254.

**Storax** (*Liquidambar orientalis*, Miller; Fam. *Hamamelidaceæ*).

*Historical and Pharmacognostic Review.* Under the caption of "The Story of Storax," Prof. Philemon E. Himmell writes interestingly on the subject of storax, tracing its history from the earliest times, giving its chemical composition, mentioning its sources and method of collection, its adulterants, medicinal uses, and uses in pharmacy. Regarding the latter, he expresses the opinion that the National Formulary should contain dependable formulas for pharmaceutical preparations, such as ointment, liniment, spirit, soap, oil, syrup, etc., for physicians' use. The paper should be consulted.—Merck's Rep., November, 1913, 286-288.

**Vanilla Beans** (*Vanilla planifolia*, Andrews; Fam. *Orchidaceæ*).

—*Are They Adulterated?*—Professor Chas. H. LaWall observes that vanilla beans have never been looked upon as subject to adulteration other than by substitution of inferior varieties. Sometime ago, however, rumors reached the United States' market that certain growers and shippers of Mexican vanilla beans were using substances that can be looked upon only as adulterants, such weighting materials as glycerin and calcium chloride, and also that certain growers were using in the curing processes preservatives such as salicylic acid and formaldehyde. Thus far, however, no confirmation of the alleged practices has been obtained after the examination of a number of samples. Calcium chloride and glycerin are both readily detected by appropriate tests applied to the residue obtained by evaporating an aqueous extract of 10 Gm. of the chopped beans, while amounts of 0.001 Gm. each of formaldehyde and of salicylic acid added to 20 Gm. of the beans were readily detectable in the distillate obtained by shaking the chopped beans with 50 Cc. of water and distilling off 5 Cc., applying to one-half of this distillate the ferric chloride test for salicylic acid, and

to the other half Rimini's test for formaldehyde—the specific method of manipulation being described, as also the method of conducting blank experiments made with untreated beans.—*Drugg. Circ.*, July, 1913, 384–385.

**Viburnum Prunifolium**, L. (Fam. *Caprifoliaceæ*).—*Macroscopic Description of the Root, Stem, and Foliage*.—Quoting the official (U. S. P.) description of the bark of *Viburnum prunifolium*, L., and mentioning that the root-bark is more highly esteemed than that of the branches, Theo. Holm briefly reviews the chemical and pharmacological history of the drug, and then describes the macroscopic and microscopic structure of the root, stem and foliage of the plant, illustrating his text with 16 figures which he has drawn from nature. These show a flowering branch of the plant from Maryland; a magnified flower; a fruiting branch specimen from Texas; a section of the fruit; and leaf specimens from Georgia, Missouri and Maryland, the other drawings showing the microscopic internal structure of the several organs of vegetation concerned.—*Merck's Rep.*, February, 1913, 35–37.

#### INORGANIC CHEMISTRY.

**Alum.** *A Mountain of It in New Mexico*.—Daniel M. Grosh directs attention to a recently completed survey by the U. S. Geological Survey of an enormous deposit of aluminous ores in the southwest corner of New Mexico. The deposit comprises an area of over two square miles, and the mountain rises to a height of 900 feet above the Gila River. The deposit is so pure that any grade of manufacturing alum can be prepared cheaply as compared to that from other sources, and for many uses it can be marketed in the natural state. In connection with the manufacture of aluminium, owing to the constantly increasing demand for this metal, the enormous value of this deposit cannot be overestimated, and in connection with enormous beds of lignite at hand to produce the power necessary for its reduction, this can be effected at a cost of one-fourth to one-half that of the hydroelectric power.—*Merck's Rep.*, May, 1913, 124.

**Blue Gelatin Copper.**—*Discovery and Method of Preparation*.—In a paper presented at the Eighth International Congress of Applied Chemistry, Wilder D. Bancroft and F. R. Briggs announce the recent discovery of "blue gelatin copper" and describe the method by which it was obtained and may be manufactured. They say that copper and the copper alloys such as brass and the



bronzes lend themselves very readily to artistic decoration by means of colored superficial films or "patinas." Great as is the variety of colors which may thus be imparted to copper, nevertheless a rich and true blue patina has hitherto been practically unknown. It was while seeking such a blue surface film that the electrolysis of copper acetate solutions containing gelatin was first performed, but at first without any practical result, until, quite by chance, an electrode freshly coated with a layer of the gelatin copper was by an oversight allowed to remain in the solution of copper acetate from which a film of metal had just been deposited and the current was turned off. On removing the electrode from the solution, it was noticed that the brown color originally possessed by the cathode film had given place to a purplish blue of extraordinary brilliancy and beauty. This led to further experiments, with the result that eventually a remarkable series of color changes were produced upon the surface of the copper deposit; hues of startling evenness and intensity followed each other in regular succession until the electrodes had acquired a magnificent deep blue coloration. The practical process for obtaining this valuable product is described, but must be consulted in the original paper.—*Merck's Rep.*, August, 1913, 205-206.

**Hydrogen Peroxide.**—*Preservation with Acetanilide.*—A. M. Clover publishes the results of a comprehensive series of experiments, undertaken to ascertain the comparative value of the preservatives that have been proposed and are used for preserving solutions of  $\text{H}_2\text{O}_2$  from change. The preservatives tried were:  $\text{H}_2\text{SO}_4$ ,  $\text{H}_3\text{PO}_4$ ,  $\text{HCl}$ , succinic acid,  $\text{KCl}$ ,  $\text{NaCl}$ ,  $\text{K}_2\text{SO}_4$ ,  $(\text{NH}_4)_2\text{SO}_4$ ,  $\text{MgSO}_4$ ,  $\text{BaCl}_2$ , and acetanilide. The results under varying conditions are given in detail in a series of six tables, and convince the author that of all the preservatives tried, acetanilide stands at the head. Properly applied, solutions of  $\text{H}_2\text{O}_2$  preserved with acetanilide show a change from the normal not exceeding 2.7% of the original content after 5 or 6 months.—*Amer. Jour. Pharm.*, December, 1913, 538-545.

**Hypophosphorous Acid.**—*New Method of Assay.*—Horace North proposes to neutralize hypophosphorous acid with barium hydroxide, collect any precipitate that forms on a filter and weigh after ignition. The weight in milligrams per gram of absolute acid is termed the *barium number*, which readily detects excessive amounts of foreign acids (sulphuric, oxalic, tartaric, phosphoric, phosphorous), and should not be greater than 5. The method is carried out as follows:

Put 1 Cc. of hypophosphorous acid in a tared stoppered Erlenmeyer flask and weigh accurately. Add 20 Cc. of recently boiled water and a few drops of phenolphthalein solution. Titrate with N 5  $\text{Ba}(\text{OH})_2$  (standardized against N 5  $\text{HCl}$ ) until a permanent pink color is produced. Put the flask into a water oven for an hour, then collect any precipitate that may have formed on a 7 Cm. Swedish filter, washing with hot water until the filtrate no longer yields a turbidity with dilute sulphuric acid, and burn the filter in a platinum crucible. Deduct the ash of the filter from the weight of the residue. The corrected weight in milligrams divided by the weight in grams of absolute acid indicated by the titration is the barium number. Examples are given.—*Amer. Jour. Pharm.*, April, 1913, 147-148.

**Strontium Salts.** *Importance of Purity.* Professor Joseph Kahn, calling attention to the importance of purity of the strontium salts, which in recent years have been used with increasing favor for internal medication, and particularly of freedom, as far as possible, from barium salts, to which toxic effects observed after the administration of strontium salts are due, mentions that owing to the extreme difficulty of removing the last traces of barium, strontium salts containing less than 1 in 1000 of barium may be used in medicine. This difficulty is probably due to the manner in which the metals of this group ( $\text{Ba}$ ,  $\text{Ca}$  and  $\text{Sr}$ ) are associated, never more than two together; for if two of them are found in the same mineral they will usually be those which stand next to each other in the group; thus,  $\text{SrCO}_3$  is found together with  $\text{BaCO}_3$  in *witherite*, while  $\text{CaCO}_3$  is associated with  $\text{SrSO}_4$  in *celestite*. The potassium dichromate test is used in the U. S. P. for determining the limit of barium; but the physician can also detect the impurity physiologically by the gastro-intestinal irritation, increased arterial pressure produced, and also the heart-beats, if the salt contains  $\text{Ba}$  in excessive quantity. The most important strontium salts used in modern therapeutics are the bromide, the iodide, and the salicylate, to which certain advantages are attributed over the bromides, iodides and salicylates of  $\text{K}$  and  $\text{Na}$  usually employed. Some of these advantages are described, together with the particular cases in which they are indicated.—*Pract. Drugg.*, February, 1913, 28.

**Terra Alba.**—*What Is it?*—Chas. H. LaWall observes that for many years previous to the passage of the Federal Food and Drugs Act of June 30, 1906, the substance "terra alba" had been as-

sociated with confectionery in the sense of its being an adulterant and cheapener. Terra alba being specifically mentioned in the Federal Act, and also in many of the State laws as a prohibited adulterant, and the question, "what is terra alba," having been put to him directly, he has made an exhaustive inquiry into the definitions given by the different authorities, the results of which are quoted in detail. Gypsum being mentioned as synonymous with terra alba, Professor LaWall was at first disposed to so regard it, but the few definitions found among the many authorities consulted failed to agree as to its identity, kaolin, white clay, compounds of alumina, silica and magnesia, and talc being mentioned among others. The best definition, perhaps, is that given in "Webster's International Dictionary" (1900), *viz.*: "Terra alba (L. white earth) (Com.), a white, amorphous, earthy substance consisting of burnt gypsum, aluminum silicate (kaolin), or some similar ingredient, as magnesia." Amer. Jour. Pharm., February, 1913, 49-51.

#### ORGANIC CHEMISTRY.

**Cinchona Alkaloids.** — *Characteristic Color Reaction with Alpha-Naphthol.* — G. N. Watson finds that when an aqueous solution of quinine sulphate is treated with a few drops of freshly prepared saturated alcoholic solution of alpha-naphthol, to which a few drops of concentrated  $\text{H}_2\text{SO}_4$  (2 drops to 1 Cc.) have been added, a yellow precipitate is produced, and when the reagent is added in excess a yellow solution is formed. Quinidine, cinchonine and cinchonidine sulphates, or their solutions in dilute  $\text{H}_2\text{SO}_4$ , give the same reaction. The characteristic color is produced in dilutions of 1 : 2000 of quinine sulphate. So far as investigated, no other white alkaloids will give the yellow color, and the author has been able to detect the presence of the several cinchona alkaloids in atropine, morphine, cocaine, strychnine, caffeine, brucine, codeine and antipyrine by this new test. The chloroform or ether residues of any of the cincho alkaloids mentioned, produce with a drop of the reagent an intensely yellow color. — Amer. Jour. Pharm., November, 1913, 502.

**Heroin (Diacetyl-Morphine).** — *Relation of the Dose to That of Morphine.* — The editor of the "Practical Druggist," Mr. Raubenheimer, mentioning that at the April meeting of the New York Branch of the A. Ph. A. it was stated that it was proposed by the conferees on the Harrison Narcotic Bill to recommend that preparations containing one-half grain of opium, one-quarter grain of morphine, or *one-third grain of heroin* (per fluid ounce?

Rep.) should be exempt, was impressed with doubt as to the correctness of this solution of their respective dosage. Accordingly, he consulted pharmacopœial and other authorities, and from the results of his observations, which he quotes, feels justified in the conclusion that, the safe dose of heroin being given as one-sixth to one-third that of morphine, it would be safer to say *one-twentieth grain of heroin as the equivalent of one-quarter grain of morphine.*—Pract. Drugg., May, 1913, 30.

**Zygadenine.** *A Toxic, Crystalline Alkaloid from Zygadenus intermedius.*—F. W. Heyl, F. E. Hepner and S. K. Loy have succeeded in isolating from the leaves of *Zygadenus intermedius*, by a process described, a toxic alkaloid, zygadenine, in a pure, crystalline condition. The substance melts sharply at 200°–201° C., and gives analytical results which correspond to the formula  $C_{39}H_{63}NO_{10}$ . It forms orthorhombic blocks when crystallized from alcohol, but forms radiating clusters of shining needles when crystallized from benzene; is soluble in chloroform, much less in ligroin or ethyl acetate, and ether is a poor solvent. It is moderately toxic, its action being similar to that of veratrine. Merck's Rep., December, 1913, 308–310; from Journ. Amer. Chem. Soc.



# LIST OF MEMBERS WHO HAVE DIED SINCE THE PUBLICATION OF THE 1912 YEAR BOOK

January 1, 1913 to May 1, 1915

DECEASED	RESIDENCE	ELECTED
Allen, H. B.	Richland Center, Wis.	1908
Ashim, B. J.	San Francisco, Calif.	1908
Baur, Jacob	Chicago, Ill.	1879
Bean, J. Arthur	Somerville, Mass.	1910
Becker, Chas. Lewis	Ottawa, Kans.	1892
Bexton, Edw. Wm.	Omaha, Neb.	1908
Blahnik, Marie (Mrs.)	Chicago, Ill.	1905
BLAKE, JAS. E.	New Bedford, Mass.	1866
BORELL, HENRY A.	Philadelphia, Pa.	1874
Boyd, Geo. W.	Washington, D. C.	1883
Brucker, Carl Frederick	Passaic, N. J.	1902
Carter, H. W.	Indianapolis, Ind.	1908
Claren, Geo. V.	New Orleans, La.	1909
COOK, THOMAS PENROSE	New York, N. Y.	1878
Cooper, Jas. E.	Lexington, Ky.	1907
ELLIOT, HENRY A.	Baltimore, Md.	1859
ELLIS, EVAN T.	Philadelphia, Pa.	1857
Fairbanks, Geo. E. B.	Providence, R. I.	1909
Foledo, E. M.	Havana, Cuba	1911
FROHWEIN, RICHARD	Elizabeth, N. J.	1867
GALE, EDWIN O.	Chicago, Ill.	1857
GOODWIN, WM. W.	Newburyport, Mass.	1853
HANCE, EDWARD HANCE	Philadelphia, Pa.	1857
Hannan, Owen	Cleveland, Ohio	1893
Hengst, John Edwin	Baltimore, Md.	1900
Hitchcock, John E.	Plattsburgh, N. Y.	1892
Hubbard, Fred A.	Newton, Mass.	1907
Jesson, Jacob	Ontario, Calif.	1872
Keim, Chas. A.	Madison, Wis.	1913
KNABE, GUSTAVUS ALEXANDER	Montgomery, Ala.	1876
Knoebel, Thomas	East St. Louis, Ill.	1892
Krapf, Emile F.	Pittsburg, Pa.	1915
Lacey, William Henry	Philadelphia, Pa.	1907
Lee, William Estell	Philadelphia, Pa.	1905
Lehman, Louis	Chicago, Ill.	1905
Lohmann, Herman J.	Jersey City, N. J.	1896
McINTYRE, WILLIAM	Philadelphia, Pa.	1868
Merrell, Geo.	Cincinnati, Ohio	1897
MORRISON, JOS. E.	Montreal, Canada	1888
Morse, Frank D.	Portland, Me.	1902
Nichols, Thomas B.	Salem, Mass.	1887
OLDBERG, OSCAR	Chicago, Ill.	1873
Osborn, F. D.	Davenport, Ia.	1913
OTTINGER, JAMES JEREMIAH	Philadelphia, Pa.	1876
Perkins, Benj. A.	Portland Me	1878

PETTIT, HENRY M.....	Carrollton, Mo.....	1860
Raymow, Thos. F.....	Brooklyn, N. Y.....	1913
SAUNDERS, WM.....	London, Ont.....	1860
Shimer, Samuel Mortimer.....	Middletown, N. Y.....	1904
SIMSON, FRANCIS C.....	Halifax, Nova Scotia, Can.....	1876
SKELLY, JAMES JOSEPH.....	New York, N. Y.....	1866
STEELE, JAS. GORDON.....	San Francisco, Calif.....	1859
Taylor, John M.....	Bradford, Vt.....	1912
WENZELL, WILLIAM THEODORE, San Francisco, Calif.....		1870
Weringhaus, Ludwig.....	San Francisco, Calif.....	1912
WHITFIELD, THOMAS.....	Chicago, Ill.....	1865
WOLTERS DORF, LOUIS.....	Chicago, Ill.....	1865
Wood, A. F., Jr.....	West Haven, Conn.....	1890
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Schelenz, Professor Dr. Hermann, Kaiser Str. 53 I Cassel, Germany.....	1912
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(List corrected to June 14th, 1915.)

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- |  |   |
|--|---|
| <p>Abbett, Wm. A.,<br/>205 W. Superior st., Duluth, Minn.</p> <p>Abreu, Gerardo F.,<br/>103 San Miguel st., Havana, Cuba.</p> <p>Acheson, Wm. R.,<br/>80 River st., Cambridge, Mass.</p> <p>Ackerman, Philip J.,<br/>549 N. High st., Columbus, O.</p> <p>Ackermann, A. H., Pharm.D.,<br/>148 Dudley st., Boston, Mass.</p> <p>Ackermann, Albert G., Ph.G.,<br/>4228 Irving Park Blvd., Chicago, Ill.</p> <p>Adamick, Gustave H.,<br/>182 Madison st., Chicago, Ill.</p> <p>Adams, Arthur E.,<br/>71 Genesee st., Auburn, N. Y.</p> <p>Adams, D. Brice,<br/>Warren, Ind.</p> <p>Adams, James H.,<br/>Box 164, Sagamore, Mass.</p> <p>Adams, Walter D.,<br/>Forney, Tex.</p> <p>Adan, Francisco V.,<br/>49 General Gomez, Camaguey, Cuba.</p> <p>Alacan, Jose, P., Phar.D.,<br/>Calle 17 entre, Ky. I. Vedado,<br/>Havana, Cuba.</p> <p>Albers, Wm. W.,<br/>301 3rd st., Wausau, Wis.</p> <p>Alberts, M. Lee,<br/>834 Downer ave., Milwaukee, Wis.</p> <p>Albrecht, P. Gerhard,<br/>Cleveland School of Pharmacy,<br/>Cleveland, Ohio.</p> <p>Albus, Charles I.,<br/>743 E. Market st., Louisville, Ky.</p> <p>Aldridge, Alice (Mrs.),<br/>1816 N. 4th st., Columbus, Ohio.</p> | <p>Alkire, Lewis L.,<br/>1596 So. Pearl st., Denver, Colo.</p> <p>Allard, Herman Joseph,<br/>580 Pelham ave., Bronx, New York.</p> <p>Allen, E. Floyd,<br/>1538 Nicollet ave., Minneapolis, Minn.</p> <p>Allen, Wm. H.,<br/>Detroit Technical Institution,<br/>Detroit, Mich.</p> <p>Allison, Wm. O.,<br/>100 William st., New York, N. Y.</p> <p>Alpers, Otto,<br/>282 City Island ave., City Island, N. Y.</p> <p>Alpers, Wm. C.,<br/>14th st. &amp; Central ave.,<br/>Cleveland, O.</p> <p>Alsberg, Carl L., A.B., A.M., M.D.,<br/>3443 14th N. W., Washington, D. C.</p> <p>Alt, Frederick F.,<br/>208 E. 84th st., New York, N. Y.</p> <p>Althoff, Samuel Y.,<br/>Owl Drug Co., Dallas, Tex.</p> <p>Altman, Jos.,<br/>919 Intervale ave., New York, N. Y.</p> <p>Amann, Frank,<br/>208 Market st., Portsmouth, O.</p> <p>Ambler, Jessie H.,<br/>412 Elm st., St. Louis, Mo.</p> <p>Amos, Wilber S.,<br/>c. McPike Drug Co.,<br/>7th and Central sts.,<br/>Kansas City, Mo.</p> <p>Anderson, Adolph Emil,<br/>711 16th st., Moline, Ill.</p> <p>Anderson, Albert Franklin, Ph.G.,<br/>St. Johns, Ariz.</p> <p>Anderson, Carl G.,<br/>901 Wells st., Chicago, Ill.</p> |
|--|---|



- Anderson, Ingewald A., Ph.G.,  
Dow City, Ia.
- Anderson, Oscar L.,  
Commerce & Enroy,  
Dallas, Texas.
- Anderson, Wm. C., Ph.G., Phar.D.,  
315 Greene ave., Brooklyn, N. Y.
- Anding, C. E.,  
Leakesville, Miss.
- Andrews, George M.,  
9-11 No. Main st.,  
Woodstown, N. J.
- Annis, Helen Perle,  
132 E. LaSalle ave., Kenmore, N. Y.
- Anspach, Paul B., Ph.G.,  
61 N. 4th st., Easton, Pa.
- Anthony, Edwin P.,  
178 Angell st., Providence, R. I.
- Apmeyer, Chas. A.,  
2546 Auburn ave., Cincinnati, O.
- Apple, Franklin M., Ph.G., Phar.D.,  
31st & Berks sts., Philadelphia, Pa.
- Appleton, Wm. R.,  
Lock Box 162, Warren, Ark.
- Arbaugh, Rufus C., Ph.G.,  
Jasper, Ark.
- Archer, Fred W.,  
1181 Washington st., Dorchester,  
Mass.
- Arledge, I. Curtis,  
4242 Wirt st., Omaha, Neb.
- Armstrong, Thomas Call,  
80 River st., Cambridge, Mass.
- Armstrong, Thos. S., Ph.G.,  
Park & North aves., Plainfield, N. J.
- Arnold, Wm. C.,  
Houtzdale, Pa.
- Arny, Harry V., Ph.G., Ph.D.,  
115 W. 68th st., New York, N. Y.
- Arrington, Harry Seldan,  
244 Church st., Norfolk, Va.
- Asher, Philip,  
1606 St. Charles ave., New Orleans, La.
- Atkins, Edgar Golden,  
Savannah, Tenn.
- Atkinson, Lawrence,  
Holly, Mich.
- Averill, Thomas P.,  
206 W. Main st., Frankfort, Ky.
- Avery, Chas. H.,  
5460 Ridgewood st., Chicago, Ill.
- Averyt, Henry M.,  
426 Baldwin ave., Detroit, Mich.
- Avis, James L.,  
83 So. Main st., Harrisonburg, Va.
- Axt, J. H.,  
740 2d st., Ft. Madison, Ia.
- Ayers, John Raymond, Jr.,  
101 Chestnut st., Everett, Mass.
- Babcock, Percival W.,  
71 Lisbon st., Lewiston, Me.
- Bachman, Gustav,  
Minn. Coll. Phar., Minneapolis,  
Minn.
- Backus, Edwin J.,  
3825 Montrose Blvd., Chicago, Ill.
- Bacon, Gilbert C.,  
2038 Cherry st., Philadelphia, Pa.
- Bade, William J. F.,  
3401 Magnolia ave., St. Louis, Mo.
- Bader, Charles Henry,  
713 11th ave., S., Nashville, Tenn.
- Baer, Edward A.,  
1405 Call Bldg., San Francisco, Cal.
- Baer, Jacob M.,  
2000 Chestnut st., Philadelphia, Pa.
- Bagley, Anna G.,  
48 E. Patterson ave., Columbus, O.
- BAILEY, FREDERICK,  
Chelmsford, Mass.
- BAKER, EDWIN,  
34 Bridge st., Shelburne Falls, Mass.
- Baker, Samuel Leon,  
1554 W. 12th st., Chicago, Ill.
- Ballagh, Wilfred T.,  
S. E. Cor. Square, Nevada, Mo.
- Ballard, Chas. W., Ph.C., Phar.D.,  
M.A. c. Columbia Univ., 115 W.  
68th st., New York.
- BALLARD, JOHN W., Ph.G.,  
106 W. 2d st., Davenport, Ia.
- Ballou, Clarence O.,  
9th & Idaho, McCarty Bldg., Boise,  
Idaho.
- Balmert, Clemens A., Phar.D.,  
c. Emerson Drug Co., 308 W. Lombard  
st., Baltimore, Md.
- BALSER, GUSTAVUS,  
137 Ave. B, New York, N. Y.
- Bandy, Geo., Ph.G.,  
Wilbur, Wash.

- Bange, Otto F.,  
 111th & German sts., Newport, Ky.  
 Bank, Edward A.,  
 327 Atlantic ave., Brooklyn, N. Y.  
 Barbat-Winslow, Mrs. Josephine E.,  
 1057 Sutter st., San Francisco, Calif.  
 Barbre, John V., Jr.,  
 Farmersburg, Ind.  
 Bard, Wm. E.,  
 108 W. Main st., Sedalia, Mo.  
 Barker, Fred A.,  
 134 Main st., Gloucester, Mass.  
 Barksdale, Rogers Americus,  
 Overton, Tex.  
 Barnard, Harry A., Ph.G.,  
 171 Main st., Marlboro, Mass.  
 Barnes, Arthur Henry, Jr.,  
 Residence unknown.  
 Barnes, Henry Cooper,  
 P. O. Box 672, Roanoke, Va.  
 Barrett, Charles L.,  
 Broadway & Line st., Camden, N. J.  
 Barrett, Marcus,  
 233 W. Lake st., Chicago, Ill.  
*Bartells, Geo. C.,*  
 314 No. Ill. st., Camp Point, Adams  
 Co., Ill.  
 Bartholomew, Wm. C.,  
 3218 N. Capitol ave., Indianapolis,  
 Ind.  
 Bartleson, Rasmus,  
 Selby & Western sts., St. Paul, Minn.  
 Bartlett, James E.,  
 c. Parke Davis Co.,  
 162 N. Franklin st., Chicago, Ill.  
 BARTLETT, NICHOLAS G.,  
 2450 Calumet ave., Chicago, Ill.  
 Bartley, Elias H.,  
 65 S. Portland ave., Brooklyn, N. Y.  
 Base, Daniel, A.B., Ph.D.,  
 329 N. Schroeder st., Baltimore, Md.  
 Bass, Francis Marion,  
 Decherd, Tenn.  
 BASSETT, CHAS. H., Ph.G.,  
 109 Arch st., Boston, Mass.  
 Bastian, Otto Carl,  
 129 W. Washington st., So. Bend, Ind.  
 Basyé, Taylor C.,  
 318 Main st., Rockport, Ind.  
 Batdorf, Lydia Franke (Miss),  
 4125 West Bell st., St. Louis, Mo.  
 Bate, Henry J.,  
 559 E. 43d st., Chicago, Ill.  
 Bateman, Herbert H.,  
 337 N. Higgins ave., Missoula, Mont.  
 Battista, Angelus Andrew,  
 Sussex st., Tenino, Wash.  
 Baum, Fred C.,  
 Hospital, Ft. Slocum, N. Y.  
 Bauman, Chas. R.,  
 216 Main st., Sterling, Colo.  
 Beach, DeMott Clark,  
 50 Ogden st., Hammond, Ind.  
 Beal, Geo. D., Ph.D.,  
 Chem. Bldg., Univ. Ill., Urbana, Ill.  
 Beal, James H., ScD., Ph.D.,  
 801 W. Nevada st., Urbana, Ill.  
 Beall, Herbert Ninian,  
 1525 Connecticut ave., N. W.,  
 Washington, D. C.  
 Bear, Pierce B.,  
 787 Broad st., Newark, N. J.  
 Beard, John Grover,  
 Chapel Hill, N. C.  
 Beardsley, Andrew H.,  
 117 W. Franklin st., c. Dr. Miles  
 Med. Co., Elkhart, Ind.  
 Beasley, Robert S.,  
 364 Central ave., Hot Springs, Ark.  
 Beck, Joseph W.,  
 Mt. Vernon, Tex.  
 Becker, Irwin A., B.S., Ph.G.,  
 c. Michael Reese Hosp., Chicago, Ill.  
 Becker, Maxwell M.,  
 2465 N. Garnet st., Philadelphia, Pa.  
 Beebe, Mason G.,  
 75 Church st., Burlington, Vt.  
 Behre, John R., Sgt.,  
 H. C., U. S. A., Dept. Hos., Manila,  
 P. I.  
 Behrens, Emil C. L.,  
 2028 S. Halsted st., Chicago, Ill.  
 Behrens, John F.,  
 19 Cone st., Orange, N. J.  
 Beilstein, Christian,  
 P. O. Box 1554, Manhattan, New  
 York.  
 Beise, John H.,  
 Fergus Falls, Minn.  
 Bell, David W.,  
 Herman, Neb.

- Belson, Maynard E.,  
Rosebud, Tex.
- Bemis, Robt. Edson,  
46 Maverick Sq., East Boston, Mass.
- Benche, Carl S.,  
Hosp. Corps, U. S. A., Fort San  
Pedro, Iloilo, P. I.
- Bender, Walter C.,  
11th & Frederick sts., St. Joseph, Mo.
- Benfield, Chas. Wm.,  
E. 55th st. & Payne ave., Cleveland, O.
- Benkie, John G.,  
Kouts, Ind.
- Bennett, Kelly Edwin,  
8 Everett st., Bryson City, N. C.
- Bent, Edward C.,  
Dell Rapids, S. D.
- Benton, Wilber M.,  
223 Crescent ave., Peoria, Ill.
- Bentson, Bernard L.,  
809 8th st., S., Fargo, N. Dak.
- Bentz, Hampton H.,  
1823 S. Jefferson ave., St. Louis, Mo.
- Bentz, Henry G.,  
894 Michigan ave., Buffalo, N. Y.
- Berg, Frantz F.,  
D. Y. Butcher Drug Co., Colorado  
Springs, Colo.
- Berger, Ernest,  
P. O. Box 783, Tampa, Fla.
- Berger, Louis, Ph.G.,  
470 Lenox ave., New York, N. Y.
- Berenguer, Jose I., M.D.,  
Enramadas Y San Felix, Farmacia  
"La Especial Santiago de Cuba."
- Beringer, Geo. M.,  
501 Federal st., Camden, N. J.
- Beringer, Geo. M., Jr., P.D.,  
1033 Cooper st., Camden, N. J.
- Berkowitz, Morris E., Ph.G.,  
U. S. Quarantine Sta., Pensacola, Fla.
- Bernard, Pierre Arnold,  
P. O. Box 45, New York, N. Y.
- Berner, Carl A.,  
1555 E. Grand ave., Des Moines, Ia.
- Bernhard, Magnus,  
Sgt. Hosp. Corps, U. S. A., Manila,  
P. I.
- Bernhart, Peter K., Ph.G.,  
114 N. Phillips ave., Sioux Falls, S. D.
- Bernström, Nils G.,  
Kronans Droghandel, Göttenborg,  
Sweden.
- Berry, Alonzo Brun,  
186 Pleasant st., Morgantown,  
W. Va.
- Berryman, Robert S.,  
Versailles, Ky.
- Bertram, E. O.,  
614 Helen ave., Detroit, Mich.
- Bertrams, Henry,  
Augusta, Ky.
- Best, Frank Merrell,  
120 N. 3d st., Lafayette, Ind.
- Best, John,  
2015 E. 12th st., Denver, Colo.
- Beucler, William George,  
40th st. & Penn ave., Pittsburgh, Pa.
- Beukma, Wm.,  
2217 Glenarm Pl., Denver, Colo.
- Beyschlag, Chas.,  
503 Main st., La Crosse, Wis.
- Bianco, Mike Robert,  
Du Quoin, Ill.
- Bibbins, Francis E., Ph.G.,  
4346 Cornelius ave., Indianapolis, Ind.
- Biermann, Chas. Harry,  
5110 Page Blvd., St. Louis, Mo.
- Bigelow, Clarence O.,  
106-108 6th ave., New York, N. Y.
- Bigelow, Edw. F.,  
99 Humbolt ave., Boston, Mass.
- Bilhuber, Ernst,  
45 John st., New York, N. Y.
- BILLINGS, HENRY MERRY,  
c. Forest Walker, South Poland, Me.
- Billups, Charles A.,  
Residence unknown.
- BINGHAM, CHARLES CALVIN,  
37 Main st., St. Johnsbury, Vt.
- Bingham, Wm. E., A.B.,  
1916 Broad, Tuscaloosa, Ala.
- Binz, Edw. G.,  
811 W. 32d st., Los Angeles, Cal.
- Biosca, Placido, M.D., D.S., Pharm.D.,  
Prof. Physics,  
21 y M Vedado, Havana, Cuba.
- Birch, May C. (Mrs.), Ph.G.,  
Orland, Glenn Co., Cal.
- Bird, Richard B.,  
908 Main st., Winfield, Kans.

- Bischoff, H. E.,  
     118 Fourth st., Union Hill, N. J.  
 Bishop, William Penn,  
     Crockett, Texas.  
 Black, James A., Phar.D.,  
     804 N. Carey st., Baltimore, Md.  
 Black, P. N.,  
     Residence unknown.  
 Blackwood, Russell T.,  
     52d & Girard ave., Philadelphia, Pa.  
 Bladen, John M.,  
     Cedar City, Utah.  
 Blair, Henry C.,  
     Walnut & 8th sts., Philadelphia, Pa.  
 Blake, Harry W.,  
     1096 Commonwealth ave., Boston,  
     Mass.  
 Blake, John Henry,  
     597 Valley Road, Upper Montclair,  
     N. J.  
 Blake, Lynn Stanford,  
     Auburn, Alabama.  
 Blakeley, Geo. C.,  
     3132 2d st., The Dalles, Ore.  
 Blakeslee, Louis Geo.,  
 Mallinckrodt Ch. Wks., St. Louis, Mo.  
 Blalock, Jesse N.,  
     218 Cherry st., Seattle, Wash.  
 Blanding, Wm. O.,  
     54 Weybosset st., Providence, R. I.  
 Blank, Herman G., Jr., Ph.D.,  
     Springdale, Pa.  
 Blank, Nicholas, J.,  
     10th & Isabella sts., Newport, Ky.  
 Bletcher, Henry E. J.,  
     422 Notre Dame, Winnipeg, Man.,  
     Can.  
 Bloch, Jacob Maurice,  
     17 Poplar st., Richmond Hill, L. I.,  
     N. Y.  
 Blocki, John,  
     Indiana ave. & 13th, Chicago, Ill.  
 Blodau, Gus A.,  
     1235 5th ave., No. Nashville, Tenn.  
 Blodau, Robert P.,  
     402 Indiana ave., Indianapolis, Ind.  
 Blome, Walter H.,  
     426 Baldwin ave., Detroit, Mich.  
 Bloomstein, Max,  
     506 Church st., Nashville, Tenn.  
 Blum, Otto Carl,  
     286 Taylor ave., Columbus, Ohio.  
 Blumenthal, Isadore F.,  
     N. W. Cor. Linton & Nassau Sts.,  
     Cincinnati, Ohio.  
 Blumenschein, Fred J.,  
     7217 Kedron ave., Pittsburgh, Pa.  
 Boberg, Otto J. S.,  
     206 S. Barstow st., Eau Claire, Wis.  
 Bockar, John J.,  
     139 Liberty st., New York, N. Y.  
 Bode, Theo. C.,  
     803 F. st., Salida, Colo.  
 Bodemann, Wilhelm,  
     5018 Lake Park ave., Chicago, Ill.  
 Bodimer, Roy E.,  
     381 Clay ave., Detroit, Mich.  
 Boeddiker, Otto,  
     954 6th ave., New York, N. Y.  
 Boehm, John J.,  
     1901 S. Halsted st., Chicago, Ill.  
 BOEHM, SOLOMON,  
     800 Morgan st., St. Louis, Mo.  
 BOERNER, EMIL L.,  
     113 Washington st., Iowa City, Ia.  
 Bogart, Frank E.,  
     15 Iarned st., E., Detroit, Mich.  
 Bohmansson, Robert H.,  
     3d & F. sts., Eureka, Calif.  
 Bohn, George W.,  
     520 Upper 8th st., Evansville, Ind.  
 Boldt, A. Herbert,  
     376 Jay st., Detroit, Mich.  
 Bolenbaugh, Albert,  
     School of Pharmacy, Med. College  
     of Va., Richmond, Va.  
 Bollinger, Clifford H.,  
     c. Noyes Bros. & Cutler, St. Paul,  
     Minn.  
 Bomba, Onufry J.,  
     Westhoff, Tex.  
 Bond, John B., Sr., M.D.,  
     800 W. Markham st., Little Rock, Ark.  
 Bongartz, Ferdinand A.,  
     353 Palisade ave., Jersey City Heights,  
     N. J.  
 Booker, Robert L.,  
     619 W. Main st., Richmond, Va.  
 Booth, Albert E., Ph.G.,  
     20 Chestnut st., Ludlow, Mass.



- BORING, EDWARD M.,  
N. E. cor. 10th & Fairmount ave.,  
Phila., Pa.
- Borja, P. Delille,  
S. Stanton 405, El Paso, Texas.
- Borneman, John A.,  
159 Seminole ave.,  
Norwood, Del. Co., Pa.
- Bosley, John Oliver,  
1401 King st., Wilmington, Delaware.
- Bosque, Arturo,  
38 Fejadillo st., Havana, Cuba.
- Bost, W. D., Pharm.D., Ph.C.,  
340 Eddy st., San Francisco, Calif.
- Bowen, Cyrus W., Ph.G., B.S., M.S.,  
M.D.,  
Broadway & Jackson, Brunswick, Mo.
- Bowen, Harvey S.,  
357 Woodward ave., Detroit, Mich.
- Bower, Edwin L.,  
Tenaflly, N. J.
- Bower, Stratton Valley,  
23 Williams st., Auburn, N. Y.
- Bowerman, Kenneth B.,  
238 Stockton st., San Francisco, Cal.
- Bowie, Miss Theo.,  
Grady Hospital, Atlanta, Ga.
- Bowman, Reginald Hamilton,  
Fortuna, Cal.
- Bowman, Waldo M.,  
319 Superior st., Toledo, O.
- Boyken, John Wm.,  
2271 Howard st., San Francisco, Cal.
- Boyles, Frank M.,  
c. McCormick & Co., Baltimore, Md.
- Boyson, John H.,  
1000 Valencia st., San Francisco, Cal.
- BRACK, CHARLES E.,  
Ensor & Forrest sts., Baltimore, Md.
- Bradbury, Wymond H., Phar.D.,  
459 C st., N. W., Washington, D. C.
- Bradley, F. E.,  
Noble, Oklahoma.
- Bradley, J. Luther, Sgt., H. C., U. S.  
A., Regt. Hosp., 26th Infantry,  
Texas City, Texas.
- Bradley, Theo. J.,  
Mass. Coll. of Pharm., Boston, Mass.
- Bradshaw, Samuel Sandapher,  
700 Woodland st., Nashville, Tenn.
- Bradt, Frederick T.,  
171 Blaine ave., Detroit, Mich.
- Bradt, Warren L.,  
Eagle & Howard sts., Albany, N. Y.
- Brandis, Ernest L.,  
Room 8, Capitol Bldg., Richmond, Va.
- Brashear, James P.,  
1300 Main st., Ft. Worth, Tex.
- Braun, Carl L.,  
24 North High st., Columbus, Ohio.
- Brehler, Oscar A., Ph.G.,  
P. O. Box 128, Sanger, Fresno Co.,  
Cal.
- Breitenbach, Alfred P.,  
199 Gratiot ave., Detroit, Mich.
- Brennan, James Edw.,  
5 N. Union st., Pawtucket, R. I.
- Bresler, Simon L.,  
914 16th st., Denver, Col.
- Brewer, Howard D.,  
4 Congress st., Worcester, Mass.
- Brewer, James Edward,  
1705 Cherry st., Philadelphia, Pa.
- Brewer, Justin S.,  
2113-29 Franklin ave., St. Louis, Mo.
- Brickelmaier, Paul H.,  
220 Greenwich st., New York, N. Y.
- Briggs, Andrew G.,  
204 Howitzer Pl., Richmond, Va.
- Briggs, Armand E.,  
301 Clements st., San Francisco, Cal.
- Briggs, Clifton Henry,  
c. Parke, Davis & Co., Detroit, Mich.
- Brigham, Lawrence Stanton,  
20 East Henry st., Savannah, Ga.
- Brinker, John H.,  
113 W. Main st., Bellevue, O.
- Brinton, Clement S.,  
134 S. 2d st., Philadelphia, Pa.
- Briry, Wm. S., Ph.G.,  
88 E. Wyoming ave., Melrose, Mass.
- Brittain, William Leo Broadup,  
4408 Carter st., Norwood, Ohio.
- Bromme, Wm. L., Ph.G., R.P.,  
1014 3d ave., E. Kalispell, Mont.
- Brooks, Frederick Pratt,  
702 Washington st., Norwood, Mass.
- Brower, Thos. E., Sgt. 1st Cl. H. C.,  
Ft. Oglethorpe, Dodge, Ga.
- Brown, Andrew,  
1418 Pittston ave., Scranton, Pa.

- Brown, Arthur E., Sgt. 1st Cl. H. C.,  
 Recruit Depot, Ft. McDowell, Cal.  
 Brown, Burton A.,  
 4730 Latona st., Seattle, Wash.  
 Brown, Clark L.,  
 Soldiers' Home, Attending Surgeon's  
 Office, Washington, D. C.  
 Brown, Floyd W.,  
 4 W. Main st., Lead, S. Dak.  
 Brown, Frank S., M.D., Ph.G.,  
 Telford, Tenn.  
 Brown, George Wilton,  
 1001 Washington ave., Evansville, Ind.  
 Brown, James, L. Ph.G.,  
 71 Market ave., Marshfield, Ore.  
 Brown, Linwood A., Ph.C., Pharm.D.,  
 425 Transylvania Park, Lexington,  
 Ky.  
 Brown, Robert Owen,  
 Cooper, Texas.  
 Bruce, Harry L.,  
 Main st., Groton, Mass.  
 Brumit, Juel Guilford,  
 1709 Joe Johnston ave., Nashville,  
 Tenn.  
 Brunelle, Albert J.,  
 1799-1801 S. Main st., Fall River,  
 Mass.  
 Brunk, L. D., Jr.,  
 Nowata, Oklahoma.  
 Brunstrom, Chas., Ph.G.,  
 601 4th ave., Moline, Ill.  
 Bruun, Harold M.,  
 1201 Grand ave., Chicago, Ill.  
 BRYSON, WM. S., Ph.C., M.D.,  
 Woodlawn, Pa.  
 Buckland, Thomas A.,  
 Municipal Courts Bldg., St. Louis, Mo.  
 Buckley, D. Frank,  
 688 Salem st., Malden, Mass.  
 Bucknam, Frank W.,  
 Skowhegan, Me.  
 Buckner, John C.,  
 928 Church st., Galveston, Tex.  
 Buchler, Carl Theo., Ph.G.,  
 215 Metropolitan Bldg., Grand and  
 Olive sts., St. Louis, Mo.  
 Buchler, John J.,  
 Pocatello, Idaho.  
 Bumbara, Joseph Edward,  
 1213 Washington ave., Braddock, Pa.  
 Burckart, Wm. E.,  
 734 Court st., New Castle, Pa.  
 Burdette, Bernard C.,  
 38 High st., Clinton, Mass.  
 Burdick, Dr. Alfred S.,  
 2418 Gidding ave., Chicago, Ill.  
 Burdick, Merle M.,  
 4846 N. Hermitage ave., Chicago, Ill.  
 BURGE, JAMES OSCAR, Ph.G.,  
 1502 McGavock st., Nashville, Tenn.  
 Burgheim, Jacob,  
 209 Main st., Houston, Tex.  
 Burkart, George Adrian,  
 4159 Magnolia st., St. Louis, Mo.  
 Burkett, K. S.,  
 1620 Antrim st., Pittsburgh, Pa.  
 Burleigh, Edwin P.,  
 43 Temple Place, Boston, Mass.  
 Burnette, Clifford R.,  
 Mt. Blanchard, Ohio.  
 Burnham, Alfred A., Jr.,  
 459 Dudley st., Boston, Mass.  
 Burnham, Ralph F.,  
 61 Broad st., Auburn, Me.  
 Burns, Helen Ritz,  
 22 E. Market st., Lewiston, Pa.  
 Burnside, Carl Bishop,  
 320 W. 2d st., Davenport, Ia.  
 Burroughs, Geo. L., Ph.G.,  
 781 Tremont st., Boston, Mass.  
 Burton, John C.,  
 3d st., Stroud, Okla.  
 Burvant, Emil J.,  
 2308 LaHarpe st., New Orleans, La.  
 Burvenich, A.,  
 18th & Frederick, St. Joseph, Mo.  
 Busch, Henry P.,  
 324 S. 17th st., Philadelphia, Pa.  
 Busch, Miers,  
 1006 Spruce st., Philadelphia, Pa.  
 Buschemeyer, Henry, Jr.,  
 400 4th ave., Louisville, Ky.  
 Buss, Oliver C.,  
 162 N. Franklin st., Chicago, Ill.  
 Bussey, Thomas E., Sgt. H. C., U. S.  
 A., 27th Infantry Regt. Hospital,  
 Texas City, Texas.  
 Butcher, Chas. M., Ph.G.,  
 5th & Pine sts., Camden, N. J.

- Butcher, David Y.,  
134 E. Pike's Peak ave., Colo. Springs,  
Colo.
- Butler, Frank J.,  
123 N. Mell st., Pontiac, Ill.
- Butler, Guy,  
Holbrook, Neb.
- Butters, Chas. H.,  
4132 Lyndale ave., S., Minneapolis,  
Minn.
- Buxton, Horace C.,  
Ft. Fairfield, Me.
- Byerley, Fabian,  
401 Jefferson st., Portland, Ore.
- Byers, Jason D., Sgt. 1st Cl. H. C.,  
Augusta Arsenal, Augusta, Ga.
- Byram, Henry Earle,  
Decatur, Nebraska.
- Byrnes, Garrett,  
21 Maplewood ave., Maplewood, N. J.
- Cabitt, Harry,  
109 Green st., Boston, Mass.
- Cabrero, Narciso Rabell,  
Aquadilla st., San Sebastian, Porto  
Rico.
- Caden, Alice,  
c. Caden Drug Co., Lexington, Ky.
- Cadmus, Robert C.,  
1941 Spring Garden st., Phila., Pa.
- Cahan, Samuel,  
864 N. 10th st., Philadelphia, Pa.
- Cain, Frank B., M.D.,  
Lyric Theatre Bldg., Cincinnati, O.
- Caldwell, A. C.,  
112th & Stephenson ave., Chicago, Ill.
- Calhoun, Will M.,  
6735 Frankstown ave., Pittsburgh, Pa.
- Call, Harry Barrett,  
144 Park st., Lawrence, Mass.
- Callens, John W.,  
201 Deleard st., Monroe, La.
- Campbell, Alexander,  
538 5th ave., N., Saskatoon Sask., Can.
- Campbell, Andrew,  
530 Fernando st., Pittsburgh, Pa.
- Campbell, Chas. W.,  
331 St. Mary's ave., Winnipeg, Man.,  
Can.
- Campbell, George Stelle,  
Milburn, N. J.
- Campbell, Milton,  
426 S. 13th st., Philadelphia, Pa.
- Campbell, Theo.,  
2101 N. 63d st., Overbrook, Phila., Pa.
- Canham, George E.,  
6144 Kenwood ave., Chicago, Ill.
- Cantor, Lorentz, Ph.G.,  
204 Columbia st., Brooklyn, N. Y.
- Capote, Jose,  
344 Principe Alfonso, Havana, Cuba.
- Carbonell, Francisco J., M.D.,  
Mayajigua, Santa Clara, Cuba.
- Carey, Henry B.,  
1288a 9th ave., San Francisco, Cal.
- Carl, Chas. B.,  
Greencastle, Pa.
- Carleton, Henry L.,  
Taylor, Tex.
- CARRELL, EUGENE AYERS,  
35 South st., Morristown, N. J.
- Carroll, Burdine H.,  
Colville, Wash.
- Carroll, Geo. J., Ph.C.,  
4 Parker st., Gardner, Mass.
- Carruth, Luther E.,  
Kentwood, La.
- Cartaya, Julio H.,  
20 Jesus Maria st., Havana, Cuba.
- Carter, Frank H.,  
776 Mass. ave., Indianapolis, Ind.
- Carter, Fred L.,  
38 Merrimac st., Boston, Mass.
- Carter, Fred L., Jr.,  
38 Merrimac st., Boston, Mass.
- Carter, Harlen Wilson Searight,  
Oak Hill Drug Store, Cor. Roose-  
velt and Arrow aves., Indianapolis,  
Ind.
- Cartier, Gus. O.,  
780 Main st., Willimantic, Conn.
- Caruso, Joseph,  
182 Graham ave., Brooklyn, N. Y.
- Case, Edmund Wendell,  
Main st., Picton, Ontario, Can.
- Casey, D. W.,  
Red Oak, Iowa.
- Casey, Jas. P., M.D.,  
424 Woodward st., Detroit, Mich.
- Caspari, Chas., Jr.,  
Univ. of Maryland, Baltimore, Md.

- Caspari, Chas. E.,  
2108 Locust st., St. Louis, Mo.
- Cass, Orbia Wilson,  
Crofton, Knox Co., Neb.
- Cassaday, Burton,  
1 Paris ave., W. Terre Haute, Ind.
- Cassaday, Orlin U.,  
14 W. Federal st., Youngstown, O.
- Cassell, Robert L.,  
167 W. Short st., Lexington, Ky.
- Cermak, Emil,  
1264-6 S. 13th st., Omaha, Neb.
- Chamberlain, Roy R.,  
205 Main st., Malvern, Ark.
- Chambers, Robt. T.,  
529 San Pedro ave., San Antonio, Tex.
- CHANDLER, CHARLES F.,  
116th & Amsterdam ave., New York,  
N. Y.
- Chantler, Arthur E.,  
330 Grand River ave., Detroit, Mich.
- Chapman, Thomas A.,  
353½ Yam Hill st., Portland, Ore.
- Chapple, Chas. J.,  
2815 3d ave., N., Billings, Mont.
- Charles, Corliss D.,  
120 Logan st., Denver, Colo.
- Charron, Roy Chester,  
426 Newberry st., Boston, Mass.
- Chase, Walter M.,  
National Apts., 931 Jefferson st., E.,  
Detroit, Mich.
- Cheney, Arthur L.,  
Main & Portland sts., Morrisville, Vt.
- Chipley, Julian Baker,  
108 High st., Morgantown, W. Va.
- Chism, John S., Ph.G.,  
150 N. Main st., Wichita, Kans.
- Chittick, Geo. H.,  
c. State Dairy & Food Commission,  
Des Moines, Iowa.
- Christensen, Henry C.,  
452 Bowen ave., Chicago, Ill.
- Christian, Robert J.,  
Daykin, Neb.
- Churgin, Joseph S.,  
210th st. & Gunhill Rd., New York,  
N. Y.
- Clafflin, Walter A.,  
North Ferrisburg, Vt.
- Claffin, Albert Whitman,  
70 S. Main st., Providence, R. I.
- Clapp, Lowell T.,  
59 Evans Road, Brookline, Mass.
- Clark (Mrs.), Aaron P.,  
140 So. Beach st., Daytona, Fla.
- Clark, Albert H., Ph.G.,  
74 E. 12th st., Chicago, Ill.
- Clark, Alfred William,  
801 Santa Fe Drive, Denver, Colo.
- Clark, Amos W., H. C., U. S. A.,  
General Delivery, Yale, Ill.
- Clark, Charles B.,  
P. O. Box 813, Kansas City, Mo.
- Clark, Ira B.,  
5th & Woodland sts., Nashville, Tenn.
- Clarke, Louis G., Ph.G.,  
Alder st. & West Park, Portland, Ore.
- Claus, Otto F.,  
3513 Hebert st., St. Louis, Mo.
- Clayton, Abraham T.,  
Box 266, Ogontz, Pa.
- Clayton, Chas. J.,  
1775 Humbolt st., Denver, Colo.
- Cliffe, Wm. L.,  
2778 Kensington ave., Phila., Pa.
- Cline, Raoul R. D., Ph.G., B.A., B.S.,  
A.M., M.D.,  
1227 Broadway, Galveston, Tex.
- Clough, Charles Isaac,  
Tillamook, Oregon.
- Cloughly, Orval J.,  
5601 Easton ave., St. Louis, Mo.
- Coad, Wm. A.,  
Hull, Iowa.
- Cobb, Ralph L.,  
2113 Central Viaduct, Cleveland, O.
- Coblentz, Virgil,  
23 Vine st., Brooklyn, N. Y.
- Coffee, Sidney J.,  
Missoula, Mont.
- Cohen, Herman, Ph.D.,  
69 Warrell st., New York, N. Y.
- Colcleugh, Murray C.,  
652 Notre Dame, Winnipeg, Manitoba.
- Cole, Bessie Olive (Miss),  
3618 Sycamore st., Baltimore, Md.
- Cole, Victor L.,  
22 E. Market st., Corning, N. Y.



- Coleman, Geo. E.,  
 21 Aspinwall Road, Dorchester Cen-  
 tre, Mass.  
 Coleman, John,  
 2500 Chapline st., Wheeling, W. Va.  
 Coleman, John H.,  
 Ironia, N. J.  
 Colle, Bernard,  
 1470 2d st., New York, N. Y.  
 Collier, Wm. K.,  
 7 Argyle ave., St. Paul, Minn.  
 Collins, Geo. Wm.,  
 5143 Maple st., St. Louis, Mo.  
 Collins, Stanley Herbert,  
 Lilly, S. D.  
 Collinson, F. J.,  
 302 E. Town st., Columbus, Ohio.  
 Colson, Henry Wm.,  
 74 East 12th st., Chicago, Ill.  
 Colton, Edward T.,  
 465 Pine st., Providence, R. I.  
 Combs, Delta E.,  
 948-58 Wolfram st., Chicago, Ill.  
 Cone, Alfred I.,  
 122 E. 74th st., New York, N. Y.  
 Congdon, Geo. G.,  
 Phoebus, Va.  
 Conger, Fred A.,  
 501 Selby ave., St. Paul, Minn.  
 Connell, Roy L.,  
 Livingston, Mont.  
 Connell, Thomas A.,  
 474 Main st., Winnipeg, Manitoba,  
 Can.  
 Connolly, Fred W., Ph.G.,  
 Dorchester, Mass.  
 Conyngham, Wm. B.,  
 92 William st., New York, N. Y.  
 Conzet, Rufus W.,  
 119 Cumberland st., Greenup, Ill.  
 Cooban, Benj. S.,  
 459 W. 63d st., Chicago, Ill.  
 Cook, Alfred Page,  
 342 Spring st., Portland, Me.  
 Cook, Chas. S.,  
 Bolivar, Tenn.  
 Cook, E. Fullerton, P.D.,  
 145 N. 10th st., Philadelphia, Pa.  
 Cook, Harry Clarence,  
 Langford, S. Dak.  
 Cook, Moses,  
 700 Woodland ave., Nashville, Tenn.  
 Cook, Parker;  
 928 N. Calvert st., Baltimore, Md.  
 Coolbaugh, Leonard Elsworth,  
 c. McKinney's Pharmacy, Corsicana,  
 Tex.  
 Cooney, Jos. H.,  
 499 Columbia ave., Boston, Mass.  
 Cooper, James W.,  
 1 Court st., Plymouth, Mass.  
 Cooper (Miss), Zada Mary, Ph.G.,  
 124 Bloomington st., Iowa City, Ia.  
 Cope, Edward Kreidler,  
 1961 Germantown ave., Phila., Pa.  
 Cope, Frank H.,  
 422 N. Dauphin st., Philadelphia, Pa.  
 Cope, Roy Thomas,  
 314 Main st., Irwin, Pa.  
 Cordes, Henry,  
 1301 Curtis st., Denver, Colo.  
 Cordivenus, W. M.,  
 653 Sutter st., San Francisco, Calif.  
 CORNELL, EDWARD A., Ph.G.,  
 1200 W. 4th st., Williamsport, Pa.  
 Correa, John Francis, Jr.,  
 426 Newberry st., Boston, Mass.  
 Correll, Eugene P.,  
 427 F st., Eureka, Cal.  
 Corrigan, Dominick F.,  
 1484 S. Main st., Fall River, Mass.  
 Corrigan, Michael H.,  
 1654 Westminster st., Providence,  
 R. I.  
 Cost, Anthony C.,  
 18 South Market st., San Jose, Cal.  
 Costelo, David,  
 918 Sixth ave., New York, N. Y.  
 Cotner, Henry W.,  
 Athens, Ohio.  
 Coughlin, John,  
 177 Water st., Augusta, Me.  
 Coulson, James T.,  
 c. Adolphus Pharmacy, Dallas, Tex.  
 Coussens, Bettie P. (Miss),  
 5125 Von Verson ave., St. Louis, Mo.  
 Covington, Robert Earl,  
 White House, Tenn.  
 Cowan, Ernest L.,  
 82 Congress st., Rumford, Maine.

- Cox, Albert E.,  
105 Main st., Brattleboro, Vt.
- Cox, Edwin G.,  
Craig, Mo.
- Cox, J. Harry,  
New Lebanon, N. Y.
- Craig, Hugh,  
122 S. Mich. Blvd., Chicago, Ill.
- Craine, Percy P.,  
Elyria, O.
- Cramer, Louis,  
72 Clinton st., Saratoga Springs, N. Y.
- Crampton, Ferd. L.,  
2301 Lexington ave., Kansas City, Mo.
- Crane, Frank T., Ph.G.,  
Machias, Me.
- Crane, Geo. W.,  
421 Michigan ave., Detroit, Mich.
- Creagan, Wm. T.,  
425 Court st., Brooklyn, N. Y.
- Creighton, Mary L. (Miss), Ph.C.,  
611 Indiana ave., Urbana, Ill.
- Crockett, Wm. G.,  
113 W. 64th st., New York, N. Y.
- Crooks, Harry W.,  
169 Elwood ave., Newark, N. J.
- Crossley-Holland, Frank W., F.C.S.,  
39 Farrington Road, London, Eng.
- Crossman, Geo. A.*,  
Taunton, Mass.
- Crowe, Robert Latta,  
879 Madison ave., Memphis, Tenn.
- Crowley, James Patrick,  
800 W. 31st st., Chicago, Ill.
- CULBRETH, DAVID M. R.,  
Spring Lake Beach, Lucab Cottages,  
N. J.
- Cutley, John, Ph.G.,  
2479 Washington ave., Ogden, Utah.
- Cummings, William Leon,  
117 Standart st., Syracuse, N. Y.
- Curd, Thomas N.,  
800 N. 21 st., Richmond, Va.
- Currens, Turner Fee,  
57-59 E. 11th st., New York, N. Y.
- Currier, Harold S.,  
Plymouth, N. H.
- Curry, Gordon Laten,  
104 W. Chestnut st., Louisville, Ky.
- Curtis, Morris E.,  
3625 Detroit ave., Cleveland, Ohio.
- Cuthbert, Richard Wm.,  
4000 Chestnut st., Philadelphia, Pa.
- Czyzewski, Blasius J.,  
1102 Washington ave., Braddock, Pa.
- Dadd, Robert M.,  
137 Grand ave., Milwaukee, Wis.
- Daggett, V. Chapin,  
314 N. 14th st., New York, N. Y.
- Dahl, Fred,  
52 Shepard st., E. Orange, N. J.
- Daily, Augustus D.,  
Sherman, Texas.
- Dalton, Ernest,  
212 Exchange st., Chicopee, Mass.
- Dame, Ray David,  
Stratton, Neb.
- Danek, John F.,  
1228 Washington ave., N., Minne-  
apolis, Minn.
- Daneker, Howard N.,  
20 S. Mount st., Baltimore, Md.
- Danhauer, William Edward,  
404 Frederica st., Owensboro, Ky.
- Daniell, Walter Harold,  
40 Myrtle st., Boston, Mass.
- Darbaker, L. K., Ph.G., Phar.D.,  
415 N. Highland ave., Pittsburgh, Pa.
- Dare, Chas. F.,  
84 E. Commerce st., Bridgeton, N. J.
- Darling, Joshua F.,  
U. S. Appraisers' Store, New York,  
N. Y.
- Dauber, Curt Louis,  
Mascoutah, Ill.
- Davenport, Jesse St. John, Sergt. H.  
C., U. S. A.,  
Residence unknown.
- Davies, Llewellyn P.,  
Central City, Colo.
- Davis, A. T.,  
Warren, Ark.
- Davis, Chas. H.,  
24 State st., Bangor, Me.
- Davis, Chas. L., Ph.G.,  
63 State st., Newburyport, Mass.
- Davis, Ernest C., Ph.C.,  
11 N. Howard st., Akron, O.
- Davis, Eugene M.,  
309 Lion st., Dunkirk, N. Y.
- Davis, Hamilton Ewart,  
Andrews, No. Car.

- Davis, Harry A.,  
721 13th st., N. W., Room 6,  
Washington, D. C.
- Davis, John C.,  
37 12th st., Wheeling, W. Va.
- Davis, Peter B.,  
P. O. Box 473, Narragansett Pier, R. I.
- Dawson, Byron F., Ph.C.,  
Corning, Tehama Co., Cal.
- DAWSON, EDW. S., JR.,  
125 S. Salina st., Syracuse, N. Y.
- Dawson, John Henry, Ph.G.,  
2489 Howard st., San Francisco, Cal.
- Day, Elsie,  
2030 Sumner st., Lincoln, Neb.
- Day, Wm. B., Ph.G.,  
74 E. 12th st., Chicago, Ill.
- Dayton, Walter H., Ph.G.,  
Secy. Utah State Board Pharm.,  
c. Dayton Drug Co., Salt Lake  
City, Utah.
- DeAlemberte, Herbert Harry,  
121 S. Palafox st., Pensacola, Fla.
- Dean, J. Atlee,  
1809 Wallace st., Philadelphia, Pa.
- Deathe, Harry,  
300 Link st., Palestine, Texas.
- De Barr, Edwin,  
122 So. Muskogee st., Norman, Okla.
- Deck, Lewis C.,  
Girard, Macoupin Co., Ill.
- Decker, William Robert,  
1607 Ridge ave., Philadelphia, Pa.
- De Coster, Harry Willson,  
P. O. Box 145, Lynn, Mass.
- De Courcy, Lydia,  
N. E. Cor. 8th & Baymiller st., Cin-  
cinnati, Ohio.
- Dedrick, William F.,  
308 Wall st., Kingston, New York.
- De Forest, Wm. P.,  
Springfield Gardens, N. Y.
- De France, Geo. W.,  
161 Broad st., Grove City, Pa.
- Deibert, Thos. I.,  
103 N. Center st., Pottsville, Pa.
- De Jonge, Cornelius,  
584 E. 7th st., Brooklyn, N. Y.
- Delaney, Thos. F.,  
207 Cabot st., Beverly, Mass.
- DeLang, Alfred,  
Fourth ave. & Broadway, Cincinnati,  
Ohio.
- Delgado, Joila Estrella, M. D.,  
Jagney Grande  
Province of Matanzas, Cuba.
- Delgado, Joseph V., Ph.C.,  
Residence unknown.
- De Lorenzi, Albert,  
Main & Ervay sts., Dallas, Tex.
- Delzell, J. T.,  
Hershey, Mich.
- De-Mattia, Machele,  
292 First st., Brooklyn, N. Y.
- Denison, Arthur E.,  
815 Beech st., Terre Haute, Ind.
- Dent, Gaylord Hess,  
130 Fayette st., Morgantown, W. Va.
- Deuble, John, Ph.D.,  
105 Sherman ave., Jersey City  
Heights, N. J.
- Dewender, Wm. H.,  
167 Atlantic ave., Brooklyn, N. Y.
- Dewey, Albert H., Ph.G., B.S., M.S.,  
Purdue Univ., Lafayette, Ind.
- DEWOODY, WM. LAWRENCE,  
516 W. 4th st., Pine Bluff, Ark.
- DeYonckherre, John Fadalius,  
455 Van Dyke, W., Detroit, Mich.
- Diaz, Jose G.,  
412 Principe Alfonso, Havana, Cuba.
- Dickhut, Lawrence A., Ph.G.,  
1001 N. 5th st., Quincy, Ill.
- Dickson, Fred. Wm.,  
4314 Springdale ave., West Forest  
Park, Balt. Co., Md.
- Dickson, Robert Alexander,  
Sergt. 1st Cl., H. C., Ft. William  
McKinley, P. I.
- Diehl, August,  
644 Bedford ave., Brooklyn, N. Y.
- DIEHL, CONRAD L., Ph.M.,  
932 Cherokee Rd., Louisville, Ky.
- Diekman, Clara A. (Mrs.),  
555 E. 23d st., Brooklyn, N. Y.
- Diekman, George C.,  
115 W. 68th st., New York, N. Y.
- Diethelm, Martin,  
701 Madison ave., Toledo, Ohio.

- Dietz, Henry Warren,  
Sergt. Hosp. Corps, U. S. A.,  
Residence unknown.
- Dillenback, Garrett V.,  
111 Delaware st., Albany, N. Y.
- Dilly, Oscar C.,  
104 W. Chestnut st., Louisville, Ky.
- Dimmitt, Addison,  
4th & Chestnut sts., Louisville, Ky.
- Dimond, Harry J.,  
330 Connecticut st., Buffalo, N. Y.
- Diner, Jacob, Ph.G., M.D.,  
206 West 107th st., New York, N. Y.
- Dinkler, Frank A.,  
Hennesey, Okla.
- Dissosway, Thurston N., Ph.C.,  
23 Vine st., Brooklyn, N. Y.
- Dittmeyer, Walter E., P.D.,  
Harper's Ferry, W. Va.
- Dodds, Fred. C., Secy. Ill. St. Bd. Ph.,  
State House, Springfield, Ill.
- Dodds, Richard N.,  
5th & Monroe sts., Springfield, Ill.
- Doden, Herbert F.,  
Iowa City, Iowa.
- Dodge, Francis D.,  
69 Ave. A, Bayonne, N. J.
- Dodson, Carl M.,  
Residence unknown.
- Dohme, Alfred R. L.,  
Pratt & Howard sts., Baltimore, Md.
- Doliber, Franklin W.,  
221 Columbus ave., Boston, Mass.
- Donaghue, Richard S.,  
83 Merrimack st., Lowell, Mass.
- Donges, Wm. H.,  
628 S. Detroit st., Xenia, Ohio.
- Donnet, John Smith,  
1225 Hull st., Baltimore, Md.
- Doolittle, Roscoe E., B.S.,  
109 Hillside ave., Glenn Ridge, N. J.
- Dore, Cornelius Wm.,  
119 Martin ave., San Jose, Calif.
- Dorjahn, John A.,  
170 Burr Oak ave., Blue Island, Ill.
- Dort, Edw. H.,  
Auburn, Neb.
- Doty, Wirt P.,  
1913 Woodward ave., Detroit, Mich.
- Dougherty, Daniel T.,  
27 Center st., Bath, Maine.
- Douglas, Matthew H.,  
488 Lincoln st., Detroit, Mich.
- Dow, John P.,  
Lafayette, Colo.
- Downes, Frank Leslie,  
3 Cherry st., Binghamton, N. Y.
- Downing, Benj. F.,  
42 Broadway, Newport, R. I.
- Downs, Bertis E.,  
Welch, W. Va.
- Downs, Fred C.,  
Craig, Colo.
- Doyle, Geo. E.,  
1190 West Fort st., Detroit, Mich.
- Doyle, Joseph J.,  
Castle Shannon, Pa.
- Doyle, Robert A.,  
East Prairie, Mo.
- Drach, Charles Dixon,  
410 Walnut st., Latrobe, Pa.
- Drake, Charles,  
67 Main st., Woodbridge, N. J.
- Draper, Thomas J.,  
Brinkley, Ark.
- Dreibellis, Louis,  
37 W. Park st., Butte, Mont.
- Dreiss, Herman E. F., Ph.G.,  
119 Alamo Plaza, San Antonio, Tex.
- Dreyfus, Henry W.,  
6401 Chicago ave., Oak Park, Ill.
- Drugoncin, Nicholas,  
32 Adams ave., W., Detroit, Mich.
- DRURY, LINUS DANA, Ph.G.,  
148 Dudley st., Boston, Mass.
- Dubell, Alexander,  
Cor. Main & Washington sts., Mt.  
Holly, N. J.
- DuBois, Wm. L.,  
379 Main st., Catskill, N. Y.
- Duering, Henry C.,  
Lubbock, Tex.
- Duerr, Geo. J.,  
121 Wyckoff ave., Brooklyn, N. Y.
- Duignan, John,  
Post Hospital, Ft. Niagara, N. Y.
- Dulaney, Joseph F., P.D.,  
McKinney, Tex.
- DuMez, Andrew Grover,  
University of the Philippines, Ma-  
nila, P. I.



- DUNN, JOHN A.,  
36 Doughty st., Brooklyn, N. Y.
- Dunning, Henry A. B., Phar.D.,  
713 Lennox st., Baltimore, Md.
- Dunning, Lyman T.,  
Philips ave. & 8th st., Sioux Falls, S. D.
- Dye, Clair Albert,  
Ohio State Univ., Columbus, O.
- Dyer, Nicholas E.,  
Residence unknown.
- Dyna, Carl Frederik Julius, Ph.G.,  
State Hosp., Patton, Cal.
- Earhart, Fred. A.,  
8th & Chippewa sts., New Orleans, La.
- Easley, Joseph J.,  
Hastings, Pa.
- Eastman, Welcome B.,  
36-38 Eastern ave., St. Johnsbury, Vt.
- EBERBACH, OTTMAR,  
25 S. Main st., Ann Arbor, Mich.
- Eberhard, Homer,  
Columbia City, Ind.
- Eberhardt, Ernest G., Ph. G.,  
122 N. Arsenal ave., Indianapolis,  
Ind.
- Eberle, Eugene G., Ph.G., A.M.,  
P. O. Box 1539, Dallas, Tex.
- Eberle, Herman T.,  
204 Main st., Watertown, Wis.
- Eberly, Russell N.,  
5021 W. 11th st., Philadelphia, Pa.
- Eccles, Robert G., M.D.,  
681 10th st., Brooklyn, N. Y.
- Echols, George Jacob,  
308 West Main, Richmond, Va.
- Eckford, Joseph W.,  
Com. st., Aberdeen, Monroe Co., Miss.
- Eckler, Chas. R.,  
335 Northern ave., Indianapolis, Ind.
- Eckstein, Sol. A.,  
112 Wisconsin st., Milwaukee, Wis.
- Eddy, Wynn L.,  
Brigham, Boxelder Co., Utah.
- Ehrlicher, Henry M.,  
324 Court st., Pekin, Ill.
- Eichler, Henry,  
101 N. E. Cor. 10th & Madison ave.,  
Covington, Ky.
- Eichold, Bernard H.,  
c. Mobile Drug Co., Mobile, Ala.
- Eisele, George,  
Weissinger-Gaulbert Apartments,  
66A, Louisville, Ky.
- Eisele, Martin A.,  
310 Central ave., Hot Springs, Ark.
- Eisenman, Francis J.,  
Sgt. 1st Cl., H. C., U. S. A., Dept.  
Hosp., Manila, P. I.
- Elam, John Thos.,  
110 Ingram st., Henderson, Ky.
- Elcook, Wm. W.,  
Camp Gregg, Bayambang, P. I.
- Eldred, Frank R.,  
3325 Kenwood ave., Indianapolis, Ind.
- Elfstrand, Wilhelm,  
Lindstrom, Minn.
- Elisburg, Louis A.,  
5035 Washington Blvd., Chicago, Ill.
- Elkin, Wm. S.,  
Peachtree & Marietta sts., Atlanta, Ga.
- Elliot, Chas. S.,  
Sgt. 1st Cl. H. C., U. S. A., Regt.  
Hosp., 23d Infantry, Texas City,  
Tex.
- Elliott, George J.,  
56 10th st., Detroit, Mich.
- Ely, Ernest S.,  
North Chestnut st., Barnesville, O.
- EMANUEL, LOUIS,  
2d ave & Grant st., Pittsburgh, Pa.
- Emerson, Herman L.,  
311 Main st., Stoneham, Mass.
- Emery, Chas. Wm., Jr.,  
1901 Franklin ave., St. Louis, Mo.
- Englehard, Geo. P.,  
536 So. Clark st., Chicago, Ill.
- Engelhardt, Hermann,  
2912 Garrison ave., Baltimore, Md.
- England, Joseph W.,  
415 N. 33d st., Philadelphia, Pa.
- Englert, William Robert,  
407 Commercial st., Elko, Nevada.
- Engstrom, Ernst O., Ph.G.,  
251 North st., Pittsfield, Mass.
- Epstein, Herman J.,  
7 Page st., Boston, Mass.
- Erhart, Wm. H.,  
81 Maiden Lane, New York, N. Y.
- Erkel, Arthur Geo., Ph.C.,  
1228 Main st., N. E., Minneapolis,  
Minn.

- Estabrook, Henry Arthur,  
cor. Main and Pritchard sts.,  
Fitchburg, Mass.
- Etzel, John L.,  
Cerro Gordo, Clear Lake, Ia.
- Euler, C. G.,  
18-20 Platt st., New York, N. Y.
- Evans, Geo. B.,  
1106 Chestnut st., Philadelphia, Pa.
- Evans, Leon,  
Mayfield, Ky.
- Evans, William C.,  
189 E. Grand Blvd., Detroit, Mich.
- Everett, Edward Sewall,  
5 Bramhall st., Portland, Maine.
- Everett, Miles E.,  
North Bend, Ore.
- Eves, Robert L.,  
401 Broad st., Nashville, Tenn.
- Ewing, Samuel E.,  
Creston, Neb.
- Fack, Rudolph,  
1626 Sycamore st., Cincinnati, O.
- FAIRCHILD, BENJ. T.,  
76 Laight st., New York, N. Y.
- Fairchild, Samuel W.,  
Wash'n & Laight sts., New York, N. Y.
- Fajardo, Gabriel J.,  
128 Water st., New York, N. Y.
- Falk, John C., Ph.G., M.D.,  
4568 Page Blvd., St. Louis, Mo.
- Fancher, William Q.,  
Sergt. Hosp. Corps, U. S. A., P. O.  
c. U. S. A. T. Liscum, Manila, P. I.
- Fansler, Beatrice W. (Miss),  
1015 South Washington st.,  
Marion, Ind.
- Fantus, Bernard, M.D.,  
719 S. Ashland Blvd., Chicago, Ill.
- Farmer, F. E. D.,  
2 Merchant Row, Rutland, Vt.
- Farrell, Anna Marie (Miss),  
Vacaville, Cal.
- Farwell, Oliver A.,  
449 McClellan ave., Detroit, Mich.
- Faser, Henry M.,  
University, Miss.
- Faundo, Eduardo Garcia,  
529 Cerro st., Havana, Cuba.
- Federmann, Wm. M.,  
706-8 Delaware st., Kansas City, Mo.
- Feil, Joseph,  
1963 E. 71st st., Cleveland, O.
- Fein, Mary A. (Miss),  
Little Rock, Ark.
- Feinberg, Meyer A., Ph.D.,  
259 E. Broadway, N. Y.
- Feindt, Louis E.,  
South Orange, N. J.
- Feldner, Geo. D.,  
3218 Magazine st., New Orleans, La.
- Fender, Walter E.,  
Sergt. Hosp. Corps, U. S. A., Fort  
Adams, R. I.
- Fenger, Frederic,  
c. Armour & Co., U. S. Yards, Chicago,  
Ill.
- Fennel, Chas. T. P., Ph.G., Phar. D.,  
614 W. Court st., Cincinnati, O.
- Ferguson, Geo. A., B.P.,  
121 W. 42d st., New York, N. Y.
- Ferguson, James A.,  
S. E. cor. Howard & Thompson sts.,  
Philadelphia, Pa.
- Fernandez, Antonio Caparo'y,  
P. O. Box 50, Havana, Cuba.
- Fickhardt, Fred. L.,  
155 Main st., W., Circleville, O.
- Fields, James David,  
Lewis Hall, University of Washing-  
ton, Seattle, Wash.
- Fields, J. Larkin,  
110 E. Douglas st., Wichita, Kans.
- Fiero, Wm. W.,  
417 Woodward ave., Detroit, Mich.
- Fieselman, Sidney Frederick,  
1106 Perry ave., Peoria, Ill.
- Fine, Eben Givens,  
814 Spruce st., Boulder, Colo.
- Fink, Daniel J.,  
Holdredge, Neb.
- Finley, James A.,  
Lawrenceburg, Tenn.
- Finneran, James F.,  
100 Tremont st., Boston, Mass.
- Finney, Burt,  
201 4th st., Bismarck, N. Dak.
- Fischelis, Robert P., Ph.G., Ph.C.,  
B.Sc.,  
828 N. 5th st., Philadelphia, Pa.
- Fischer, Ray O.,  
Jefferson, Wis.

- Fischer, Richard,  
Univ. of Wisconsin, Madison, Wis.
- Fischnar, John F.,  
6901 Wentworth ave., Chicago, Ill.
- FISH, CHARLES F.,  
348 Broadway, Saratoga Springs, N.Y.
- Fisher, Geo. W.,  
De Land, Fla.
- Fitzpatrick, Patrick J.,  
6 Abbott st., Wellesley, Mass.
- Flake, William Lee,  
P. O. Box 64, Water Valley, Miss.
- Flandermeyer, August L., Ph.G.,  
3617 Woodbridge ave., Cleveland, O.
- Fleet, Chas. B.,  
700 Main st., Lynchburg, Va.
- Flemer, Lewis,  
701 Maryland ave., N. E., Wash-  
ington, D. C.
- Fletcher, David M.,  
3993 Washington st., San Francisco,  
Cal.
- Fletcher, Joel Morgan,  
901 W. Jefferson st., Dallas, Texas.
- Flint, John H.,  
2489 Howard st., San Francisco, Cal.
- Flint, Wm. S.,  
56 Franklin st., Worcester, Mass.
- Floyd, Henry B.,  
Box 321, Washington, D. C.
- Fonteyne, Gustave J.,  
72 Adams st., New Bedford, Mass.
- Foote, C. E.,  
222 W. Courtland st., Jackson, Mich.
- Forbrich, Charles Anthony,  
3752 S. Kedzie ave., Chicago, Ill.
- Ford, Chas. M.,  
P. O. Box 114, Cambridge, Mass.
- Ford, Myron Nile,  
State House, Columbus, O.
- Forman, Leroy,  
323 Market st., Trenton, N. J.
- Forster, Isidore A.,  
3129 Lyndale ave., Chicago, Ill.
- Foster, John B.,  
Roseville & 7th aves., Newark, N. J.
- Fouch, Wm. M.,  
Charles st. & North ave., Baltimore,  
Md.
- FOUGERA, EDMOND C. H.,  
309 8th st., Brooklyn, N. Y.
- Foulke, James,  
329 Arlington ave., Jersey City, N. J.
- Fox, Chas. D.,  
202 Commerce st., Roanoke, Va.
- FOX, PETER P.,  
Woodland ave. & 73d st., Phila., Pa.
- Fox, Willard M.,  
9702 Cedar ave., Cleveland, O.
- Frailay, Wm. O.,  
57 N. Queen st., Lancaster, Pa.
- Frame, A. W.,  
c. Merck & Co., Rahway, N. J.
- Frames, Jno. F., Ph.G.,  
601 N. Gay st., Detroit, Mich.
- Francis, John M., B.S., M.A.,  
240 Seyburn ave., Detroit, Mich.
- Frank, August, Ph.G.,  
408 Main st., "Town of Union,"  
Weehawken P. O., N. J.
- Frank, Louis,  
Wilkes-Barre, Pa.
- Frankel, Lewis,  
219 New Brunswick ave., Perth Am-  
boy, N. J.
- Franzoni, Joseph D.,  
627 Penna. ave., N. W., Washington,  
D. C.
- Fraser, Chas. A.,  
Red Rock, Okla.
- FRASER, HORATIO-N., Ph.G., Ph.M.,  
M.D., 583 5th ave., New York, N. Y.
- Frasier, Everett I.,  
577 Antoine st., Detroit, Mich.
- Frauenhoff, Frederick L., Ph.G.,  
136 Hinman st., Aurora, Ill.
- Frazier, Wm. J.,  
117 E. Douglas ave., Wichita, Kans.
- Freburg, Amel E.,  
402 7th st., Rockford, Ill.
- Freericks, Frank H., Ph.G., LL.B.,  
1215 Mercantile Lib. Bldg., Cincin-  
nati, O.
- French, Adelbert, P.,  
2782 Woodward ave., Highland Pk.,  
Mich.
- French, Harry B.,  
429 Arch st., Philadelphia, Pa.
- French, Howard B.,  
Fourth & Callowhill st., Phila., Pa.
- Freymark, Geo. F.,  
513 Merchant st., Ambridge, Pa.

- Frick, Daisy Adelaide,  
Audubon, Iowa.
- Fricke, Frederick Geo.,  
Union Block, Plattsmouth, Neb.
- Fricke, Fred H.,  
3218 Hebert st., St. Louis, Mo.
- Fried, Leopold H.,  
199 Summit ave., Jersey City, N. J.
- Friedenburg, Maximillian W.,  
812 Main st., Winfield, Kans.
- Friedgen, Charles,  
1220 Amsterdam ave., New York, N. Y.
- Friedman, Isaac,  
53 Halsey st., Newark, N. J.
- Frost, Wm. A., Ph.G.,  
Selby & Western aves., St. Paul, Minn.
- Frutchey, Geo. W.,  
201 E. Broad st., Westfield, N. J.
- Fry, Herman,  
5050 Kenmore ave., Chicago, Ill.
- Fry, Narcys Geo.,  
401 W. North ave., Chicago, Ill.
- FRYE, GEO. C.,  
320 Congress st., Portland, Me.
- Fuhrman, Cyrus Jacob,  
Coquille, Ore.
- Fuller, Henry Corbin,  
Institute of Industrial Research,  
19th & B sts., N. W., Washington, D. C.
- FULLER, OLIVER F.,  
235 W. Randolph st., Chicago, Ill.
- Fuson, Harry L.,  
Residence unknown.
- Gaddess, John,  
20 E. First st., Oil City, Pa.
- Gaddy, Robert Litson,  
5 West Main st., Dillon, S. C.
- Gaesser, Theobarl T., Ph.G.,  
Troy, Ind.
- Gaessler, Wm. G.,  
Ia. State Coll. Agriculture Experiment Station, Ames, Ia.
- Gahn, Henry,  
U. S. Marine Hosp., New Orleans, La.
- Gallagher, John C.,  
466 Grove st., Jersey City, N. J.
- Gamble, Stewart,  
901 Hennepin ave., Minneapolis, Minn.
- Gammon, Irving P.,  
1363 Beacon st., Brookline, Mass.
- Gane, Eustace H.,  
95 Fulton st., New York, N. Y.
- Gano, Wm. H., Ph.G.,  
Hampton Court, 207 No. 35th st., Philadelphia, Pa.
- Garcia, Octavia,  
Mannabo, Porto Rico.
- Gardner, Alex., Ph.G.,  
69 Myrtle ave., Brooklyn, N. Y.
- Gardner, Howard W.,  
1547 Capouse ave., Scranton, Pa.
- Gardner, Robert J.,  
62 Welling st., Richmond Hill, L. I., N. Y.
- Garrels, Charles,  
1110 Fairmont st., Washington, D. C.
- Garrison, Dayton B., Jr., Ph.G.,  
Connell, Wash.
- Garritty, Jeremiah G.,  
Spring Valley, Ill.
- Garvey, James A.,  
1429 Euclid ave., Philadelphia, Pa.
- Gates, William Irby,  
Gates Bldg., Whiteville, Tenn.
- Gathercoal, Edmund N.,  
74 E. 12th st., Chicago, Ill.
- Gay, St. Claire Rainsford (Mrs.),  
2787 Broadway, New York, N. Y.
- Gayle, John W.,  
Ann st. & Broadway, Frankfort, Ky.
- Geddes, Lillian M. (Mrs.),  
1377a Commonwealth ave., Allston (Boston), Mass.
- Geisler, Joseph F.,  
6 Harrison st., New York, N. Y.
- Genochio, Edward Peter,  
1709 Jackson Blvd., Apt. K., Chicago, Ill.
- GEORGE, CHAS. THEO.,  
1306 N. 3d st., Harrisburg, Pa.
- Gerald, Herbert F., M.D.,  
Creighton Univ., Omaha, Neb.
- Gerding, Elmer G.,  
3400 Chippewa st., St. Louis, Mo.
- Gering, Henry R.,  
701-703 S. 13th st., Omaha, Neb.
- GESSNER, EMIL A.,  
862 Chapel st., New Haven, Conn.



- Gibson, Frank L.,  
4141 Clarendon ave., Chicago, Ill.
- Gibson, John S.,  
Hope, Ark.
- Gidley, Wm. F., Ph.C., B.S.,  
Purdue Univ., Oak st., Lafayette, Ind.
- Gietner, Chas., Ph.G.,  
2910 S. Grand ave., St. Louis, Mo.
- Gift, Wendell J.,  
Converse, Ind.
- Gilbert, Charles A.,  
159 Broadway, Providence, R. I.
- Gilbert, Cyrus Thurston,  
9th & Asbury ave., Ocean City, N. J.
- Gilbertson, Louis S.,  
R. F. D. No. 3, Snohomish, Wash.
- Gill, L. C.,  
University Club, Ancon, Canal Zone,  
Panama.
- Gilleland, John Roy,  
59th & Water sts., Pittsburgh, Pa.
- Gilman, Elbridge W.,  
Main st., Marshfield, Vt.
- Gilmer, Bryan Brewster,  
3402 Garrott st., Houston, Tex.
- Gilpin, Henry B.,  
300-302 W. Lombard st., Balto., Md.
- Githens, Thos. S.,  
66th st., Rockefeller Institute,  
New York, N. Y.
- Givens, Milton P., Jr.,  
425 Franklin st., Denver, Colo.
- Gladding, Curtis P.,  
1203 Main st., Hartford, Conn.
- Glancy, John Douglas,  
59 Gates ave., Brooklyn, N. Y.
- Gleason, Patrick S.,  
Pine & Elm sts., Waltham, Mass.
- Glendenning, Harold,  
1 Main st., Norwalk, Conn.
- Glockler, B. E.,  
4831 Liberty ave., Pittsburgh, Pa.
- Glover, Clifford C.,  
520 Hill st., Ann Arbor, Mich.
- Glover, Wm. H., Ph.G.,  
299 Essex st., Lawrence, Mass.
- Godbold, Fabius C.,  
5601 Rosemary Pl., New Orleans, La.
- GODDING, JOHN G., Ph.G.,  
278 Dartmouth st., Boston, Mass.
- Godlust, Oscar M.,  
1566 3rd ave., New York, N. Y.
- Gokay, William Lewis,  
417 Main st., Bennington, Vt.
- Goldsborough, Chas. H.,  
Box 267, Culpepper, Va.
- Goltz, Carl Julius,  
P. O. Box 1273, Havana, Cuba.
- GOOD, JAMES M.,  
2601 Olive st., St. Louis, Mo.
- Goodale, Martin H.,  
9 E. Main st., Battle Creek, Mich.
- Goodale, P. L.,  
1227a Pendleton ave., St. Louis, Mo.
- Goodman, Philomena M. N. (Mrs.),  
3163 Mission st., San Francisco, Calif.
- Goodrich, Forest Jackson,  
6307 Brooklyn ave., Seattle, Wash.
- Goodwin, Howard,  
291 Atlantic ave., Boston, Mass.
- Goodyear, Wilbur B.,  
1901 Derry st., Harrisburg, Pa.
- Goodykoontz, Chas. H.,  
Bluefield, W. Va.
- Goosey, Gilbert H., Sgt. H. C.,  
Post Hosp., Ft. Meade, S. D.
- Gordin, Henry M.,  
31 W. Lake st., Chicago, Ill.
- Gordon, Eugene,  
851 Tinton ave., New York, N. Y.
- Gordon, Fred. T., Ph.C., B. S.,  
4650 No. 13th st., Philadelphia, Pa.
- Gordon, Jean (Miss),  
1415 Byron st., Chicago, Ill.
- Gorenflo, Oscar W.,  
Washington Arcade, Detroit, Mich.
- GORGAS, GEO. A.,  
16 N. 3d st., Harrisburg, Pa.
- Gosch, Clarence G.,  
San Saba, Tex.
- Goudy, Earl Edward,  
Beach City, O.
- Gould, George H.,  
106 E. Main st., Louisville, Ky.
- Graber, Howard T.,  
636 Trumbull ave., Detroit, Mich.
- Grace, Robert F.,  
331 Chartres st., New Orleans, La.
- Grace, Wm. D.,  
14 Market Square, Portsmouth, N. H.

- Gradon, Walter A.,  
     561 E. Salmon st., Portland, Ore.  
 Graham, Willard,  
     7420 Sprague st., Mt. Airy, Phila., Pa.  
 Grant, John H.,      Jacksboro, Tenn.  
 Grasser, John J.,  
     1234 St. Andrew st., New Orleans, La.  
 Grassly, Chas. Wm.,  
     802 W. 12th st., Chicago, Ill.  
 Graver, Kittie Harbord,  
     2 Bronson Apts., Ardmore, Pa.  
 Graw, Paul,  
     531 E. Water st., Milwaukee, Wis.  
 Gray, Margaret M. (Mrs.),  
     4151 Gladys ave., Chicago, Ill.  
 GRAY, Wm.,  
     Congress & Hood sts., Chicago, Ill.  
 Green, Benj.,  
     12 Market Sq., Portsmouth, N. H.  
 Green, Franklin T.,  
     500 Devisadero st., San Francisco, Cal.  
 Green, James H.,  
     12 Barnard Apts., Omaha, Neb.  
 Green, Robert L.,  
     Stu. Offi. Univ. N. D., Notre Dame,  
     Ind.  
 Green, Wm. W.,  
     Steamboat Springs, Colo.  
 Greenbaum, Solomon,  
     66 Ave. D., New York, N. Y.  
 Gregg, Thos. D.,  
     1 Main st., Harrisburg, Ill.  
 Gregory, Willis G., Ph.G., M. D.,  
     344 Richmond ave., Buffalo, N. Y.  
 Greule, Albert M.,  
     4th & Overton sts., Newport, Ky.  
 Grewe, Louis F., Ph.G.,  
     Grand & Russell aves., St. Louis, Mo.  
 Greyer, Chas. P.,  
     Morgantown, N. C.  
 Greyer, Julius,  
     1926 Race st., Cincinnati, O.  
 Griebing, Frank A.,  
     3605 W. 32d ave., Denver, Colo.  
 Griesedieck, Bernard H.,  
     Sarah & St. Louis ave., St. Louis, Mo.  
 Griesemer, Lloyd P.,  
     9 E. Woodland ave., Baltimore, Md.  
 Griffen, Truman,  
     2547 Hennepin ave., Minneapolis,  
     Minn.  
 Griffin, Lyman W.,  
     63 Warren ave., Boston, Mass.  
 Griffith, Chas.,  
     306 Main st., Johnstown, Pa.  
 Grimany, Frederico, M.D.,  
     P. O. Box 125, 2 Calvario, Santiago  
     de Cuba.  
 Groat, Harrison Sidney,  
     Renton, Washington.  
 Grommet, Geo. H.,  
     2001 Jefferson ave., East,  
     Detroit, Mich.  
 Groom, John I.,  
     West Lafayette, Ind.  
 Grover, Geo. E.,  
     146 Broadway, Somerville, Mass.  
 Groves, Henry C.,  
     68 W. Broadway, Ocala, Fla.  
 Grunow, Oliver M.,  
     93 Gratiot ave., Detroit, Mich.  
 Guenther, Harry F. J.,  
     6430 St. Clair st., Cleveland, Ohio.  
 Guerich, Waldermar,  
     21 Ellis st., San Francisco, Calif.  
 Guerin, James F.,  
     236 Front st., Worcester, Mass.  
 Guerrero, Juan C.,  
     Encinal, Tex.  
 Guerrero, Leon M.,  
     117 Calle a Mabini Ermita,  
     Manila, P. I.  
 Guest, Wilbert H.,  
     1158 Central ave., Los Angeles, Cal.  
 Gundrum, Geo.,  
     329 W. Main st., Ionia, Mich.  
 Gunn, Horace Edgar,  
     Main st., Uxbridge, Mass.  
 Gunn, Wm. J.,  
     3134 Park ave., St. Louis, Mo.  
 Haack, Rudolph G.,  
     351 Alder st., Portland, Ore.  
 Haertlein, George H.,  
     830 State st., Milwaukee, Wis.  
 Haesler, Loren M.,  
     1960 W. Madison st., Chicago, Ill.  
 Haeusgen, Henry Otto,  
     Anchorage, Ky.  
 Hagee, Wm. P.,  
     101 N. Main st., St. Louis, Mo.  
 Hageman, Theodore Chas.,  
     1500 Chouteau ave., St. Louis, Mo.

- Hagemann, Wm. H., Ph.G.,  
1001 N. 5th st., Quincy, Ill.
- Hagenow, Theo. F.,  
1500 Chouteau ave., St. Louis, Mo.
- Hahn, Chas. W. J. H.,  
2301 Salisbury st., St. Louis, Mo.
- Hahn, Gustave,  
Ft. Hancock, N. J.
- Hahn, Wm.,  
105 Union st., Newton Center, Mass.
- Haines, Frank A., Ph.G., Ph.C.,  
1407 Farrar st., St. Louis, Mo.
- Hall, Albert Basslett,  
3741 College ave., Indianapolis, Ind.
- Hall, George Chalmers,  
1422 52d st., Brooklyn, N. Y.
- Hall, Joseph P.,  
920 Washington Sq., Suffolk, Va.
- Hall, Wm. A.,  
200-202 Griswold st., Detroit, Mich.
- Hall, Wm. D.,  
35th & Queen Lane, Falls of Schuyl-  
kill, Philadelphia, Pa.
- Hallaway, Robert R., B.Sc., Ph.D.,  
5 Devonshire st., Carlisle, Eng.
- Halstead, Alice L. (Mrs.),  
1101 E. Front st., Muscatine, Ia.
- Hamann, Wm. A.,  
100 William st., New York, N. Y.
- Hamilton, Herbert C., Chem. Eng.,  
c. Parke Davis Co., Detroit, Mich.
- Hamilton, Mary R. (Miss),  
Pinney st., Rochester General Hos-  
pital, Rochester, Pa.
- Hammar, Alrick, Ch. Phar. U. S. N.,  
614 Ohio st., Vallejo, Cal.
- Hammett, Frank U.,  
2630 Pine st., St. Louis, Mo.
- Hamner, Edw. C.,  
1113 Main st., Lynchburg, Va.
- Hamner, James F.,  
Recruit Depot, Ft. McDowell, Cal.
- Hance, Anthony M.,  
623 Callowhill st., Philadelphia, Pa.
- Hancock, James E.,  
4 S. Howard st., Baltimore, Md.
- HANCOCK, JOHN F.,  
4 S. Howard st., Baltimore, Md.
- Handy, John Abner,  
c. P. & P. Dept., Larkin Co., Buffalo,  
N. Y.
- Hankey, Wm. T.,  
1390 W. 9th st., Cleveland, O.
- Hanlon, William T., Sgt. H. C., U. S. A.  
Ambulance Co., No. 5, Texas City,  
Texas.
- Hannah, Malcolm E.,  
18 S. Palafox st., Pensacola, Florida.
- Hansen, Mathew K.,  
S. 1st Cl. H. C., U. S. A., Recruit  
Depot, Barracks, Columbus, O.
- Harbaugh, Wilson L.,  
Haverford, Montgomery Co., Pa.
- Harbold, Curtis A.,  
1820 Columbia ave., Philadelphia, Pa.
- Harbold, John T., P.D., M.D.,  
R. 12, York, Pa.
- Hardigg, William L.,  
812 2nd st., Evansville, Ind.
- Hardin, John H.,  
126 S. Front st., Wilmington, N. C.
- Harding, Charles F.,  
S. E. Cor. Liberty & John sts., Cin-  
cinnati, O.
- Hare, Ralph E.,  
Hosp. Corps., Ft. Mills, Corregidor, P.I.
- Harman, Harry M., M.D.,  
Bridge st., Frenchtown, N. J.
- Harms, Herman,  
312 Boyd P'k Bldg., Salt Lake City,  
Utah.
- Harper, J. Earle,  
Spencer, Neb.
- Harrah, John W.,  
1718 4th ave., S., Minneapolis, Minn.
- Harrington, Edward W.,  
203 W. Sixth ave., Columbus, O.
- Harrington, Frank,  
1330 Forsythe ave., Columbus, O.
- Harris, Alva O.,  
524 Miller ave., Columbus, Ohio.
- Harris, Harry L.,  
100 Williams st., New York, N. Y.
- Harris, Samuel J., Sgt. H. C., U. S. A.,  
3131 Washington st., San Francisco, Cal.
- Harrison, George Waller,  
Railway ave., Cypress River, Mani-  
toba.
- Harrison, Harry S.,  
417 S. Clinton st., Baltimore, Md.
- Hart, Wm. F.,  
11 S. Arlington ave., East Orange, N. J.

- Harter, Isaac F., M.D.,  
Stronghurst, Ill.
- Harting, Rudolph R.,  
Short & Mill sts., Lexington, Ky.
- Hartwell, Geo. Henry,  
Main & Central sts., Southbridge,  
Mass.
- Hartwig, Otto J.,  
1950 Milwaukee ave., Chicago, Ill.
- Hartz, Johann D. A.,  
1147 3d ave., College Point, N. Y.
- Hartz, Wm. T.,  
301 20th st., Rock Island, Ill.
- Haschenburger, Edmond O., Ph.G.,  
1211 O st., Lincoln, Neb.
- Hassinger, Samuel E. R.,  
Fairmount ave. & 23d st., Phila., Pa.
- Hatcher, Robert A.,  
414 E. 26th st., New York, N. Y.
- Hatton, Ellmore W.,  
134 N. High st., Columbus, O.
- Hauenstein, Sidney,  
Bluffton, O.
- Hauptman, David H., Ph.G.,  
Park st., Gardiner, Mont.
- Haussamen, Henry L., Ph.G.,  
Grafton, N. D.
- Haussman, Fred. W.,  
1627 N. 8th st., Philadelphia, Pa.
- Havenhill, L. D.,  
1539 Vermont st., Lawrence, Kan.
- Hawkins, John M.,  
East Prairie, Mo.
- Hawkins, Tom W.,  
c. Marvin, Main & Akard sts.,  
Dallas, Tex.
- Hawthorne, Herman F.,  
2038 Mass. ave., Cambridge, Mass.
- Hay, Chas. La Mar,  
209 DuBois ave. DuBois, Pa.
- Hay, Edw. A.,  
439 Cumberland ave., Portland, Me.
- Haydock, Susannah G.,  
2123 Locust st., Philadelphia, Pa.
- Hayes, Horace P.,  
312 Elk st., Buffalo, N. Y.
- Haymaker, Frank B.,  
316 Main st., Clarksburg, W. Va.
- HAYNES, DAVID O.,  
3 Park Place, New York, N. Y.
- Haynes, Herbert,  
159 Broadway, Providence, R. I.
- Haynes, Manley H.,  
319 Arthur st., N. E., Minneapolis,  
Minn.
- Hays, Francis B.,  
Oxford, North Carolina.
- Hayward, Lawrence B.,  
1091 2nd ave., Detroit, Mich.
- Headen, Claude Thomas, Ph.C.,  
201 Frederick st., San Francisco, Cal.
- Hebberd, Edw. S.,  
331 Main st., La Crosse, Wis.
- Hechler, Edw. H.,  
3719 Broadway, Cleveland, O.
- Heckerman, Adam B.,  
Port Royal (Juniata Co.), Pa.
- Heddesheimer, William, G.,  
2482 8th ave., New York, N. Y.
- Heebner, Chas. F.,  
Ontario Coll. Ph., Toronto, Ont., Can.
- Heffner, Edgar F.,  
Main & Grove sts., Lock Haven, Pa.
- Heidbreder, Albert H.,  
500 S. 8th st., Quincy, Ill.
- Heim, Henry,  
1001 James ave., Saginaw, Mich.
- Heim, Wm. J.,  
1454 N. 10th st., Philadelphia, Pa.
- Heimerzheim, Eugene,  
567 Central ave., Brooklyn, N. Y.
- Heinemann, Albert F.,  
54 S. Washington st., Valparaiso, Ind.
- Heinemann, Edwin,  
1572 Elm st., Cincinnati, O.
- Heinritz, Lebrecht G.,  
16 Washington ave., Holyoke, Mass.
- Heintzelman, Joseph A.,  
Ridge & College aves., Phila., Pa.
- Heisler, John E.,  
Centerville, S. D.
- Heister, Louis,  
S. E. Cor. 7th & Elm sts., Cincinnati,  
O.
- Helfman, Joseph,  
c. Parke Davis & Co., Detroit, Mich.
- Heller, Charles T.,  
33 W. 10th st., St. Paul, Minn.
- Hellmuth, Joseph A.,  
2148 N. Robey st., Chicago, Ill.



- Hemm, Francis,  
3854a Arsenal st., St. Louis, Mo.
- Hemping, Harry,  
Tekamah, Neb.
- Henkel, Alice, Assistant U. S. D. Agr.,  
Washington, D. C.
- Henkel, Chas. B.,  
29-31 Maryland ave., Annapolis, Md.
- Henning, Adolph,  
137 Water st., New York, N. Y.
- Henry, Arthur M., B.S., 2d Lieut.,  
N. G. F., Homestead, Fla.
- Henry, Frank C.,  
703 15th st., N. W., Washington, D. C.
- Henry, Samuel C.,  
508 S. 61st st., Philadelphia, Pa.
- Hensel, Samuel Theodore, Ph.G.,  
351 Mercantile Bldg., Denver, Colo.
- Hensge, William,  
10500 Cedar ave., Cleveland, Ohio.
- HEPBURN, JOHN,  
103 Main st., Flushing, N. Y.
- Herald, Mansfield B.,  
1027 Story st., Boone, Iowa.
- Hereth, Franklin S.,  
23 Vine st., Brooklyn, N. Y.
- Hermanek, Joseph C.,  
4016 W. 26th st., Chicago, Ill.
- Hermann, Christopher, S.H.C., U. S.  
A., Presidio of Monterey, Calif.
- Herpich, John L.,  
166 E. Main st., Columbus, O.
- Herrera, Francisco, M.D.,  
85 Cuba st., Havana, Cuba
- Herting, August C.,  
3408 Federal st., Camden, N. J.
- Hess, John L.,  
2038 Cherry st., Philadelphia, Pa.
- Hess, Paul L.,  
3101 Troost ave., Kansas City, Mo.
- Hess, Walter Isadore,  
818 Bridge st., Humbolt, Kan.
- Hessler, Elmer H.,  
300 S. 12th st., Philadelphia, Pa.
- Heusler, Philip L.,  
Emerson Dg. Co., Bromo Seltzer  
Tower Bldg., Baltimore, Md.
- Hickerson, Wm. H.,  
Warren, Huntingdon Co., Ind.
- Hickey, Wm. A.,  
1402 Pendleton ave., St. Louis, Mo.
- Hicks, Claude Everett,  
602 S. K St., Tacoma, Wash.
- Hicks, John E. F.,  
Hicks & Hawly Drug., Goldsboro,  
N. C.
- Highley, L. E.,  
Hot Springs, S. D.
- Hilpert, Willis S.,  
543 E. 34th st., Chicago, Ill.
- Hilton, Emily K. (Mrs.),  
Socorro, N. Mex.
- HILTON, SAMUEL L., PHAR.D.,  
1033 22d st., N. W., Washington, D. C.
- Hindes, Joseph F.,  
Relay, Baltimore Co., Md.
- Hindman, Frances Edith, Ph.C., M.S.  
(Miss),  
University of Wash., College of  
Pharmacy, Seattle, Wash.
- Hines, Luke Carleton, Ph.D.,  
216 Washington st., Jersey City, N. J.
- Hinski, Hermon Leon,  
2738 E. Allegheny ave.,  
Philadelphia, Pa.
- Hirth, Paul H.,  
271 Lincoln st., Detroit, Mich.
- Hitchcock, Chas. H.,  
999 Beacon st., Brookline, Mass.
- Hoch, Quintus,  
2429 Frankford ave., Phila., Pa.
- Hodges, Jesse D.,  
207<sup>1</sup>/<sub>2</sub> Main st., Little Rock, Ark.
- Hodges, Wilbur D.,  
2712 Taylor st., E. Chattanooga, Tenn.
- Hodson, Eugene W.,  
101 E. Baltimore st., Baltimore, Md.
- Hoester, Julius C.,  
108 S. 4th st., St. Louis, Mo.
- Hoey, Charles Edward,  
459 Dudley st., Roxbury, Mass.
- Hoffelt, Edw.,  
Estelline, S. D.
- Hoffman, Chas. O.,  
Arcanum, O.
- Hoffman, Edward, Ph.G.,  
Residence unknown.
- Hoffman, Geo. W.,  
321 4th st., Logansport, Ind.
- Hoffman, John Irvin,  
Coal Dale, Pa.

- Hoffmann, Geo. F., Ph.G.,  
Pesotum, Ill.
- Hohmann, Geo.,  
751 Courtland ave., New York, N. Y.
- Holliday, Francis E.,  
81 Fulton st., New York, N. Y.
- Holloway, Jesse D., Ph.C.,  
Cor. 6th & Broadway, E. Liverpool, O.
- HOLMES, CLAYTON W.,  
410 W. Gray st., Elmira, N. Y.
- Holmes, Henry E.,  
P. O. Box 1897, Seattle, Wash.
- Holmes, Ralph C.,  
281 Greene ave., c. Bristol & Meyer,  
Brooklyn, N. Y.
- Holroyd, Robert McFerrin,  
92 Beverly ave., Morgantown, W. Va.
- Holstrom, William A.,  
914 W. 3d st., Huron, S. Dak.
- Holt, Frank, Sgt. 1st Cl. H. C., U. S. A.,  
Camp John Hay, P. I.
- Holthoefer, Herman J.,  
5030 Prairie ave., Chicago, Ill.
- Holtzman, Chas. H.,  
Baltimore & Centre, Cumberland, Md.
- Holverson, Henry T.,  
Alexandria, Minn.
- HOLZHAUER, CHAS.,  
53 Spruce st., Newark, N. J.
- Holzhauser, Chas. Wm., A.B., Ph.G.,  
787 Broad st., Newark, N. J.
- HOOD, CHAS. IRA,  
Merrimac & Central sts., Lowell, Mass.
- Hood, Harry A.,  
1622 Otto Blvd., Chicago Heights, Ill.
- Hoover, Geo. W.,  
Food Inspection Laboratory, 1607  
Transportation Bldg., Chicago, Ill.
- Hopkins, Jesse L.,  
Woodbridge Bldg., New York, N. Y.
- HOPP, LEWIS C.,  
1104 Euclid ave., Cleveland, O.
- Horlick, Alexander J.,  
Horlick Food Co., Racine, Wis.
- Horlick, William,  
c. Horlick's Malted Milk Co., Ra-  
cine, Wis.
- Horlick, William, Jr.,  
c. Horlick's Malted Milk Co., Ra-  
cine, Wis.
- Horn, Joe L.,  
601 St. Louis ave., Fort Worth, Tex.
- HORN, WILBUR F.,  
26 W. High st., Carlisle, Pa.
- Horne, Warren W., Ph.C.,  
23 Hay st., Fayetteville, N. C.
- Horstmann, Gustave, Ph.D.,  
136 So. 8th ave., Mt. Vernon, N. Y.
- Horton, Chas. H., Phar.D.,  
809 N. Jefferson ave., St. Louis, Mo.
- Hostmann, Jeannot,  
1208 Hudson st., Hoboken, N. J.
- Hottinger, Otto G.,  
801 Milwaukee ave., Chicago, Ill.
- Houck, David L.,  
Elizabeth, Pa.
- Houghton, E. M., Ph.C., M.D.,  
c. Parke Davis & Co., Detroit, Mich.
- Houston, Peter S.,  
46 Warner st., Dorchester, Mass.
- Hover, Wm. A.,  
1437 Lawrence st., Denver, Colo.
- Hover, William Tracy,  
426 Gilpin st., Denver, Colo.
- Howard, Charles H.,  
Market Square, South Paris, Maine.
- Howard, Fletcher (Mrs.),  
401 S. Grand ave., Los Angeles, Cal.
- Howard, James D., Ph.G.,  
Andrews, N. C.
- Howell, Edw. V.,  
Univ. Drug. Co, Chapel Hill, N. C.
- Howson, Arthur B.,  
Paint & Main sts., Chillicothe, O.
- Howson, William Scott,  
Sergt. 1st Cl. H. C., U. S. A., Frank-  
fort Arsenal, Pa.
- Hoye, Daniel J.,  
Overton, Neb.
- Hron, Ralph Preston,  
31 N. State st., Salt Lake City, Utah.
- Hubbard, Geo. W.,  
1118 First ave., So., Nashville, Tenn.
- Hubbard, Winfield S., Ph.G., B.S.,  
M.A., Ph.D., Room 505, c. Bureau  
of Chemistry, Washington, D. C.
- Hudelson, F. H.,  
Weatherford, Okla.
- Huder, Henry J.,  
52 E. Washington st., Indianapolis,  
Ind.

- Hudiburg, Alfred, Ph.C.,  
 Main & Center sts., Turlock, Cal.  
 Hudson, Arthur,  
 265 Washington st., Newton, Mass.  
 Hudson, John R.,  
 136 Prospect st., Waltham, Mass.  
 Hudson, Wm. G.,  
 2035 Elizabeth st., Shreveport, La.  
 HUESTED, ALFRED B.,  
 Delmar, Albany Co., N. Y.  
 Huffman, Bertha G. (Mrs.),  
 4311 Forrest Park Blvd., St. Louis,  
 Mo.  
 Hugh, Chas. H., Ph.C.,  
 98 Western ave., Minneapolis, Minn.  
 Hughes, Francis S.,  
 15th & Oxford sts., Philadelphia, Pa.  
 Hughes, James A.,  
 19th & Chester ave., Bakersfield, Cal.  
 Huggill, R. E.,  
 32 Adams st., Detroit, Mich.  
 Hummel, John A.,  
 New Madrid Co., New Madrid, Mo.  
 Hummel, Joseph O. E.,  
 5144 Hazel ave., W. Phila., Pa.  
 Humphrey, John D.,  
 Bristow, Okla.  
 Hund, Geo. B.,  
 San Anselmo, Cal.  
 Hunsberger, Ambrose,  
 1600 Spruce st., Philadelphia, Pa.  
 Hunsche, Frederick,  
 4415 N. Winchester ave., Chicago, Ill.  
 Hunt, Frank Louis,  
 47 West Main st., Norwich, N. Y.  
 Hunt, Reid,  
 240 Longwood ave., Boston, Mass.  
 Hurd, John C.,  
 26 Market st., Somersworth, N. H.  
 Huribert, Wm. A.,  
 Park Pharmacy, Wollaston, Mass.  
 Hurley, Horace O.,  
 2038 Park Pl., Louisville, Ky.  
 Hurley, John,  
 507 Main st., Little Falls, N. Y.  
 Hurty, John N., M.D., Phar.D.,  
 31 E. 11th st., Indianapolis, Ind.  
 Hutchins, Nicholas John,  
 186 Pleasant st., Morgantown, W. Va.  
 Hutman, Edward C.,  
 222 Hamilton st., Albany, N. Y.  
 Hyde, Byron M.,  
 202 Main st., E., Rochester, N. Y.  
 Hyde, John D.,  
 Sulphur Springs, Tex.  
 Hyde, Joseph B., Jr., Ph.G.,  
 141 Broad st., Charleston, S. C.  
 Hynson, Henry P.,  
 423 N. Chas. st., Baltimore, Md.  
 Ilhardt, Wm. K.,  
 4836 Delmar Blvd., St. Louis, Mo.  
 Ingram, Frederick Fremont, Jr.,  
 56 Tenth st., Detroit, Mich.  
 Irwin, Charles H.,  
 U. S. Public Health Service, Fair-  
 port Harbor, Ohio.  
 Irwin, William W.,  
 Cor. 24th & Chapline sts., Wheeling,  
 W. Va.  
 Isakovics, Alois von,  
 Monticello, N. Y.  
 Ittner, Wm. F.,  
 2233 S. Grand ave., St. Louis, Mo.  
 Ivanoff, Petko Lazaroff,  
 32 Adams ave., Detroit, Mich.  
 Jackman, Wilbur F.,  
 69 Medbury ave., Detroit, Mich.  
 Jackson, Hugh C.,  
 622 Congress ave., Austin, Texas.  
 Jackson, John E.,  
 Tazewell, Va.  
 Jackson, Lester N.,  
 10th ave. N. & Jefferson, Nashville,  
 Tenn.  
 Jacob, Charles William,  
 7405 Madison st., Forest Park, Ill.  
 Jacobs, Sinclair Sartorius,  
 c. Jacob's Pharmacy Co., Atlanta, Ga.  
 Jacobsohn, Joseph,  
 3639 Third ave., New York, N. Y.  
 Jacobson, Samuel M.,  
 171 4th st., Elizabeth, N. J.  
 Jacocks, John T.,  
 Dyersburg, Tenn.  
 Jaffa, M. E.,  
 Bureau of Food & Drugs, State  
 Board of Health, Univ. of Calif.,  
 Berkeley, Cal.  
 Jamieson, Geo. A.,  
 816 North ave., Bridgeport, Conn.  
 JAMIESON, THOS. N.,  
 4508 Woodlawn ave., Chicago, Ill.

- Janda, Thomas John Joseph,  
1017 E. Ohio st., Pittsburgh, Pa.
- Jeancon, Louis A.,  
1032 E. 97th ave., Denver, Colo.
- Jehlik, Anton J.,  
3401 West 26th st., Chicago, Ill.
- Jelinek, John P.,  
295 W. 7th st., St. Paul, Minn.
- Jenkins, Edw. H.,  
Analytical Lab., Drawer 1,  
New Haven, Conn.
- Jenkins, Elizabeth,  
5th st. & Wayne ave., Dayton, O.
- Jennings, Algernon C.,  
108 Ouachita st., Hot Springs, Ark.
- Jensen, Albert K.,  
122 E. 20th st., Cheyenne, Wyo.
- Jensen, Carroll A. B.,  
333 So. Montana st., Butte, Mont.
- Jerger, Henry Louis, Jr.,  
Broad st., Thomasville, Ga.
- Joergenson, Gerhard J. C. S.,  
Com. st., La Conner, Skagit Co.,  
Wash.
- Johann, Adam E.,  
827 W. Main st., Richmond, Va.
- John, Milo J.,  
247 5th ave., Clinton, Ia.
- Johnson, B. Arete (Miss),  
245 Main st., Penns Grove, N. J.
- Johnson, Chas. W., Ph.C., B.S., Ph.D.,  
5031 15th ave., N. E., Seattle, Wash.
- Johnson, Edw. F.,  
53 N. Monterey st., Gilroy, Cal.
- Johnson, Hans Martin,  
1110 Payne ave., St. Paul, Minn.
- Johnson, Lewis,  
Silverton, Ore.
- Johnson, Manuel, M.D.,  
30 Obispo st., Havana, Cuba.
- Johnson, Robert V., Sergt. Hosp.  
Corps, U. S. A.,  
Ambulance Co. No. 8, Galveston, Tex.
- Johnson, Theo., M.D.,  
30 Obispo st., Havana, Cuba.
- Johnson, Washington M.,  
100 W. Main st., Gainesville, Fla.
- Johnston, Ralph R.,  
522 S. East st., Bucyrus, Ohio.
- Jones, Amos,  
543 E. Thompson st., Philadelphia, Pa.
- Jones, David F., Ph.G.,  
106 Granite Block, Watertown, S. D.
- Jones, Edw. B.,  
218 High st., Mt. Holly, N. J.
- Jones, Ernest Ray,  
489 Bewick ave., Detroit, Mich.
- Jones, Harold W.,  
c. William S. Merrell Chemical Co.,  
5th & Pike sts., Cincinnati, Ohio.
- Jones, James H.,  
350 E. Fordham Road, New York,  
N. Y.
- Jones, Jose Antonio Gonzalez,  
P. O. Box 166, Barranquilla, Colum-  
bia, S. A.
- Jones, Nathaniel Hugh,  
188 Kenilworth, Detroit, Mich.
- Jones, Orel, Ph.G.,  
Oconto, Neb.
- Jones, Oscar W.,  
27 Court st., Auburn, Me.
- JONES, SIMON N.,  
2d & Main sts., Louisville, Ky.
- Jones, Wm. D.,  
107 E. Bay st., Jacksonville, Fla.
- Jongejan, Cornelius H.,  
753 Grandville ave., Grand Rapids,  
Mich.
- Jongeward, Mattys,  
154 A st., N. E., Washington, D. C.
- Jordan, Chas. B., Ph.C., B.S., M.S.,  
409 Russell st., Lafayette, Ind.
- Jorden, Henry Albert, Ph.G.,  
56 E. Commerce st., Bridgeton, N. J.
- Jorgenson, Edw. B.,  
644 Kearny st., San Francisco, Cal.
- Josenhans, Reinhardt C. J.,  
1606 W. North ave., Chicago, Ill.
- Joyce, Edward L.,  
Sgt. 1st Cl. H. C., U. S. A., Philip-  
pine Islands, Corregidor.
- Joyce, James Herbert,  
1023 Third ave., S. W., Cor. Warren,  
Detroit, Mich.
- Judd, Albert F.,  
Pitts. Coll. of Ph., Pittsburgh, Pa.
- Judisch, George,  
Ames, Iowa.
- Jurado, Bolivar, Ph.C., Ph.D.,  
National Institute, Panama City,  
Panama.



- Jurgensen, Peter H., R.Ph.,  
Cedar Co., Lowden, Ia.
- Justice, Jack Edwin,  
124 Franklin st., Clarksville, Tenn.
- Kaczoroski, Adolph O.,  
801 Canal st., New Orleans, La.
- Kaemmerer, Wm. F.,  
Residence unknown.
- Kaetzel, Chas. P.,  
608 Lawrence ave., Elwood City, Pa.
- Kagy, Elbert O., Ph.G., Ph.C.,  
3931 6th ave., Des Moines, Ia.
- Kahn, Solomon K.,  
11th st. & Wash'n ave., Phila., Pa.
- Kahre, William Frederick,  
c. Eli Lilly Co.,  
11 So. 4th st., St. Louis, Mo.
- Kalish, Oscar G., Ph.G.,  
23d st. & 4th ave., New York, N. Y.
- Kalusowski, Henry E.,  
808 1st st., N. W., Washington, D. C.
- Kantner, Leahmer M.,  
1747 Park ave., Baltimore, Md.
- Kantor, Morris, Ph.G.,  
c. Kantor & Kantor, 184th st. &  
Audubon ave., New York, N. Y.
- Kantrowitz, Hugo,  
105 W. 94th st., New York, N. Y.
- Kassulke, August,  
1150 S. Meridian st., Indianapolis, Ind.
- Katz, Otto,  
1539 Vine st., Cincinnati, O.
- Kauffman, Geo. B.,  
235 N. High st., Columbus, O.
- Kaufman, Reuben M., Ph.G.,  
Cor. High & Pine sts., Seaford, Del.
- Kearfott, Clarence P.,  
Martinsville, Va.
- Keating, Frank,  
454 Folsom Pl., Milwaukee, Wis.
- Kebler, Lyman F.,  
Bureau of Chem., Washington, D. C.
- Keller, Jacob H.,  
325 N. Market, Frederick, Md.
- Keller, Wm. O. E.,  
Arcata, Cal.
- Kelly, Gus. A.,  
11 School st., Dorchester, Mass.
- Kelly, Evander F., Phar.D.,  
Lombard & Green sts., Baltimore, Md.
- Kemp, Edw.,  
135 Water st., New York, N. Y.
- Kenaston (Mrs.), Hampton Ray, B.E.,  
M.E.,  
Bonesteel, S. D.
- Kendall, Gus. C.,  
4 So. 22d ave., Meridian, Miss.
- KENNEDY, EZRA J.,  
3 Park Pl., New York, N. Y.
- Kennedy, Robert Griffey,  
Military Hosp., Pettit Barracks,  
Zamboanga, Mindanao, P. I.
- Kent, Nick G.,  
909 Pacific ave., Tacoma, Wash.
- Kepes, Jos.,  
2017 W. 25th st., Cleveland, Ohio.
- Kercher, Edwin H., Ph.G.,  
4128 Market st., Philadelphia, Pa.
- Kettler, Edw., Jr.,  
Farwell ave. & Brady st., Milwaukee,  
Wis.
- Keys, Walter R.,  
Clayton, Del.
- Kiedaisch, Geo. A.,  
422 Main st., Keokuk, Ia.
- Kiesling, Adolph E.,  
504 Main st., Houston, Tex.
- Kiler, Abdel Wm.,  
2470 Summit st., Columbus, Ohio.
- Killey, Robert Smith, Ph.G.,  
680 S. Mill st., Aspen, Colo.
- Killingsworth, Clyde I.,  
32 Adams ave., W., Detroit, Mich.
- KILMER, FRED. B.,  
147 College ave., New Brunswick, N. J.
- Kimlel, J. Edward,  
1708 N. Madison ave., Peoria, Ill.
- Kimmich, Ernest,  
c. Parke Davis Co., Detroit, Mich.
- King, Geo. A. N.,  
c. Twin City Drug Mills, Minneapolis,  
Minn.
- King, James D.,  
214 Westmount, ave., Haddonfield,  
N. J.
- Kingman, Ignatius,  
East Grand Forks, Minn.
- Kinsel, E. C.,  
24 & 26 Michigan ave., Detroit,  
Mich.

- Kirby, Chas. P.,  
3264 Chestnut st., Philadelphia, Pa.
- Kirchgasser, Wm. C., Ph.G.,  
74 Laight st., New York, N. Y.
- Kirchgeßner, Wm. C., Ph.C.,  
7 N Division ave., Grand Rapids,  
Mich.
- Kirk, H. S.,  
519 J st., Sacramento, Cal.
- Kirk, Samuel B.,  
1400 Spruce st., Philadelphia, Pa.
- Kirk, William Palmer,  
400 Donner ave., Monessen, Pa.
- Kirkland, Derwentwater,  
606 S. Main st., Los Angeles, Cal.
- Kirschberg, Bradley Henry,  
Room 10, Lorraine Bldg., Schenec-  
tady, N. Y.
- Kishon, Adolph M., Sgt. H. C., U. S.  
A.,  
Residence unknown.
- Klar, Morris L., Ph.G.,  
107 Hope st., Passaic, N. J.
- Klein, Edw. N. E., Ph.C.,  
315 13th st., College Point, N. Y.
- Klein, Ernest F., Ph.C.,  
620 Central ave., Hot Springs, Ark.
- Kleinau, Geo.,  
941 Park ave., New York, N. Y.
- Kleiser, Robert J.,  
422 5th ave., So. Nashville, Tenn.
- KLIE, GEO. H. C., Ph.G., M.D.,  
5100 N. Broadway, St. Louis, Mo.
- Kline, Clarence M., Ph.B.,  
429 Arch st., Philadelphia, Pa.
- Klingmann, Albert,  
2631 8th ave., New York, N. Y.
- Klingmann, Otto,  
2631 8th ave., New York, N. Y.
- Klopp, Henry L.,  
3421 Spring Garden st., Phila., Pa.
- KLUSSMANN, HERMAN,  
110 1st st., Hoboken, N. J.
- Knapp, Gustav.,  
Ft. DuPont, Delaware.
- Knight, Frank H., A.B., Ph.G.,  
568 Main st., Winchester, Mass.
- Knock, Thos. F.,  
130 South ave., Petersburg, Va.
- Knobel, Percy Thomas,  
209 Collinsville ave., E. St. Louis, Ill.
- Knoefel, Bruno,  
1419 E. Spring st., New Albany, Ind.
- Knoepfel, Wm. H.,  
951 Prescott ave., Scranton, Pa.
- Knowlton, Geo. H.,  
782 Union st., Manchester, N. H.
- Knox, James R.,  
Center Point, Ark.
- Koch, Albert H.,  
2401 N. Jefferson ave., St. Louis, Mo.
- Koch, August F., Ph.G.,  
Amana, Ia.
- KOCH, JULIUS A.,  
Bluff & Pride sts., Pittsburgh, Pa.
- Koch, Wm. J.,  
651 E. 230th st., New York, N. Y.
- Koehler, Arthur Glenn,  
4271 St. Louis ave., St. Louis, Mo.
- Koehler, Wm. F.,  
603 E. Davis st., Portland, Ore.
- Koerth, Emil C.,  
Yoakum, Tex.
- Koester, Hermann,  
3301 ave. H., Galveston, Tex.
- Kohl, J. Otto,  
McMicken & Mohawk Places, Cin-  
cinnati, O.
- Kohler, Charles,  
1518 Chestnut st., Philadelphia, Pa.
- Kolbe, Emil B.,  
671 Junction ave., Detroit, Mich.
- Kolsch, Julius,  
202 Harrison ave., Leadville, Colo.
- Koon, Chas. S.,  
35 W. Western ave., Muskegon, Mich.
- Koppenbrink, Jesse E.,  
400 Main st., Higginsville, Mo.
- Kossler, Herman S.,  
206 S. Main st., Wabash Sta., Pitts-  
burgh, Pa.
- Kotte, Fred S.,  
S. E. Cor. 6th & Elm sts., Cincinnati,  
O.
- Kraemer, George Charles,  
3327 Osgood st., Chicago, Ill.
- KRAEMER, HENRY,  
145 N. 10th st., Philadelphia, Pa.
- Kraemer, William Charles,  
Wood ave., Linden, N. J.
- Kraker, John L.,  
Bozeman, Mont.

- Kramer, Chas. F.,  
Cor. 3d & Broad sts., Harrisburg, Pa.
- Kramer, Julius,  
c. Y. M. C. A., Jackson, Mich.
- Kramer, Wilhelm,  
4014 Lincoln ave., Chicago, Ill.
- Krembs, Ernest M.,  
1025 National ave., Milwaukee, Wis.
- Kremer, Berthold J.,  
88 S. Main st., Fond du Lac, Wis.
- KREMERS, ED., Ph.G., Ph.D.,  
1720 Vilas st., Madison, Wis.
- Kretz, Edw. J.,  
1800 Webster ave., Pittsburgh, Pa.
- Kriebs, Frank D., Ph.G.,  
Beresford, S. Dak.
- Krieger, John C.,  
118 Main st., Salamanca, N. Y.
- Kring, Gustav,  
2735 S. Broadway, St. Louis, Mo.
- Kuehn, William,  
2059 Seminary ave., Chicago, Ill.
- Kuenzig, Peter A.,  
316 Atlantic ave., McKeesport, Pa.
- Kuever, Rudolph A., Ph.G., Ph.C.,  
Coll. of Pharm., Iowa City, Ia.
- Kullman, Karl Wilhelm,  
434 So. Johnson st., Iowa City, Ia.
- Kulp, Geo H.,  
401 Nicollet ave., Minneapolis, Minn.
- Kurtz, Irving W.,  
316 Clark ave., St. Louis, Mo.
- Kutchbauch, John F., Ph.G.,  
1510 Scott ave., Covington, Ky.
- Kutscher, Geo. W.,  
812 Braddock ave., Braddock, Pa.
- Lackenbach, Fred I., Ph.C.,  
908 Butler Bldg., San Francisco, Cal.
- Lackey, Richard H., Ph.G.,  
500 W. Lehigh ave., Philadelphia, Pa.
- Ladakis, Traintaphyllo,  
Syrian Prot. Coll., Beirut, Syria.
- Ladish, Erich H.,  
2015 Cleveland ave., Chicago, Ill.
- Lagassé, Victor S.,  
Cor. 11th ave. & Ogden st., Denver, Col.
- LaGrange, John V., Ph.G., A.M.,  
U. S. P. H. & M. H. Service, Washington, D. C.
- Lakamp, William,  
3623 Montgomery ave., Cincinnati, O.
- Lahey, Roland Treiber,  
271 Belvidere ave., Detroit, Mich.
- Lamar, Wm. R.,  
327 N. 18th st., East Orange, N. J.
- Lamb, Earl Frederick,  
1605 E. 47th st., Seattle, Wash.
- Lambert, Alert Bond,  
2100 Locust st., St. Louis, Mo.
- Lambert, Maud, Ph.G.,  
Franklin Road Pharmacy,  
Roanoke, Va.
- Lammert, Cyrus J.,  
Burnet & Albany aves., Cincinnati, O.
- Lampa, Robert R.,  
c. Lehn & Fink, New York, N. Y.
- LAND, ROBERT H.,  
812 Broad st., Augusta, Ga.
- Land, Robert H., Jr.,  
1134 Broad st., Augusta, Ga.
- Lane, Frank Eugene, Jr.,  
4015 Blair ave., St. Louis, Mo.
- Lang, Geo., Jr.,  
3601 Salena st., St. Louis, Mo.
- Lange, Leonard A.,  
486 Market st., Milwaukee, Wis.
- Lange, Wm. Maurice,  
57 Dove st., cor. Lancaster st., Albany, N. Y.
- Langenhan, Henry A.,  
Chemistry Bldg., Univ. of Wis.,  
Madison, Wis.
- Langheinze, Louis P.,  
857 Elizabeth ave., Elizabeth, N. J.
- Lantz, Wm. H.,  
1601 Lehigh ave., Philadelphia, Pa.
- La Pierre, Elie H., Ph.G.,  
\* 80 River st., Cambridge, Mass.
- Larsen, L. P., Ph.G.,  
3201 Madison st., Chicago, Ill.
- Larson, Martin,  
Callender, Webster Co., Ia.
- Lascoff, Jacob L.,  
Lexington ave. & 83d st., New York, N. Y.
- Latham, Thomas,  
3d ave. & 75th st., New York, N. Y.
- Lathrop, Arthur E.,  
P. O. Block, Main st., Simsbury, Conn.

- Laue, John M. A.,  
175 3d st., Portland, Ore.
- Laughlin, Carlisle,  
2032 Bancroft Way, Berkeley, Cal.
- La Wall, Charles H., Ph.G., Ph.M.,  
39 So. 10th st., Philadelphia, Pa.
- LaWall, Edgar S.,  
626 Second St., Catasauqua, Pa.
- La Wall, Millicent R. (Mrs.), P.D.,  
39 So. 10th st., Philadelphia, Pa.
- Leacock, Walter Gordon,  
2210 Gratiot st., Detroit, Mich.
- Leavitt, Adoniram J.,  
590 N. Raymond st., Pasadena, Cal.
- Leavitt, Clarence Ashton,  
306 Diamond, Hillyard, Wash.
- Leber, Jacob Gilbert,  
114 Pine st., York, Pa.
- Lederle, Archibald L.,  
Leland, Mich.
- Lee, Chas. O.,  
Med. Col. Va., School of Pharmacy,  
Richmond, Va.
- Lee, John V.,  
N. E. cor. Main st. & Chicago ave.,  
Evanston, Ill.
- Lee, Richard H.,  
829 E. 15th st., Kansas City, Mo.
- Lee, Wm. E.,  
2327 Brown st., Philadelphia, Pa.
- Leeb, Theo. F.,  
501 W. 5th st., Winona, Minn.
- Leedom, Chas.,  
1403 Filbert st., Philadelphia, Pa.
- Leet, Robert A.,  
Box 477, Oakland, Cal.
- Legendre, Joseph A.,  
124 Baronne st., New Orleans, La.
- Lehman, Chas. N.,  
Broadway & Main sts., Tottenville,  
N. Y.
- Lehman, Chas. Walter,  
310 Central ave., Hot Springs, Ark.
- Lehman, George T.,  
2032 N. 4th st., Columbus, Ohio.
- Lehman, Robert S.,  
375 3d ave., New York, N. Y.
- Lehmann, Louis, J.,  
2601 Washington ave., St. Louis, Mo.
- Lehr, Frank P.,  
5400 Franklin ave., Cleveland, Ohio.
- LEIS, GEO.,  
747 Massachusetts ave., Lawrence,  
Kan.
- Leisenring, Willis,  
14 N. Saginaw st., Pontiac, Mich.
- Lemasters, Wm. O.,  
Lock Box 199, Brooksville, Fla.
- LEMBERGER, JOSEPH L., Ph.G., Ph.M.,  
5 N. 9th st., Lebanon, Pa.
- Lemos, Constantine Diamenti,  
Rue Trassa, Smyrna, Asia Minor.
- Lengfeld, Joseph L.,  
272 Post st., San Francisco, Cal.
- Leonard, Edwin F.,  
72 Main st., Springfield, Mass.
- Lerche, Albert E.,  
325 Main st., Springfield, Mass.
- Lester, Geo. F.,  
Arrowsmith, Ill.
- Leverly, John A.,  
608 Park ave., Bridgeport, Conn.
- Levine, Victor Emanuel,  
437 W. 59th st., New York, N. Y.
- Lewis, Ernest G.,  
701 Center st., Jamaica Plain, Mass.
- Lewis, Griffith R.,  
379 E. Bennett ave., Cripple Creek, Col.
- Lewis, Henry,  
509 State st., Madison, Wis.
- Lewis, Lawrence C.,  
Tuskegee, Ala.
- Lewis, Walter,  
Regt. Hosp. 27th Inf., Texas City,  
Texas.
- Lichthardt, Geo. H. P.,  
1800 M st., Sacramento, Cal.
- Lieber, Jewel Carl,  
Rgt. Post Hosp., Ft. Sam Houston,  
Texas.
- Lieberstein, Jacob, Ph.G.,  
2329 N. Union Blvd., St. Louis, Mo.
- Lieberstein, Louis,  
223 S. Euclid av., St. Louis, Mo.
- Liebemann, Elias, Ph.D.,  
308 E. 57th st., New York, N. Y.
- Lienhart, Adolph H.,  
Ft. Michie, N. Y.
- Light, S. Rudolph,  
c. UpJohn Co., Kalamazoo, Mich.
- Lillie, Foress B.,  
204 Harrison ave., Guthrie, Okla.



- Lilly, Eli,  
 1420 Meridian st., Indianapolis, Ind.  
 Lilly, Josiah K.,  
 4 West St. Joe, Indianapolis, Ind.  
 Lincoln, Clarence Shelp,  
 Ceresco, Neb.  
 Lindgren, A. Julius,  
 402 Central ave., W., Duluth, Minn.  
 Lindley, Patrick H.,  
 Havana, Kans.  
 Lindly, John M., Ph.G.,  
 Winfield, Henry Co., Ia.  
 Lindvall, Chas. G.,  
 1303 13th st., Moline, Ill.  
 Linn, J. B.,  
 Canton, Mo.  
 Linton, Arthur W.,  
 Coll. of Pharm., Univ. of Wash.,  
 Seattle, Wash.  
 Lipscomb, W. L.,  
 c. Taylor Drug Co., Dyersburg,  
 Tenn.  
 Llarena, y Maria G.,  
 Jesus del Monte 518, Havana, Cuba.  
 Llewellyn, Henry Duncan,  
 West Side Square, Mexico, Mo.  
 LLEWELLYN, JOHN F.,  
 Public Sq., Audrian Co., Mexico, Mo.  
 LLOYD, JOHN URI,  
 Court & Plum sts., Cincinnati, O.  
 Lock, Frank E.,  
 1133 Seneca st., Buffalo, N. Y.  
 Lockie, Peter M.,  
 2646 Main st., Buffalo, N. Y.  
 Loertz, Carl E.,  
 1 E. Second st., Seymour, Ind.  
 Loesch, Wm.,  
 3040 Wentworth ave., Chicago, Ill.  
 Loesser, Paul A.,  
 Monroe & Lawrence ave., Toledo, O.  
 Lohmann, John,  
 887 Market st., Kingston, Pa.  
 Lohmeyer, Henry L.,  
 1901 Carson st., Pittsburgh, Pa.  
 Lohness, Archie P.,  
 565 Quincy st., Brooklyn, N. Y.  
 Long, John Harper,  
 2421 Dearborn st., Chicago, Ill.  
 Lord, Frank J.,  
 1101 Larimer st., Denver, Colo.  
 Lovis, Henry C.,  
 2139 7th ave., New York, N. Y.  
 Low, Harry (Mrs.),  
 Apt. 402, 1625 Polk st., San Fran-  
 cisco, Calif.  
 Lowe, Clement B., Ph.B., M.D.,  
 Lovebrook, Vineland, N. J.  
 Lowry, William J., Jr.,  
 42 Talbot Road, Windsor Hills,  
 Baltimore, Md.  
 Lucas, Frank K.,  
 Avon, N. Y.  
 Luck, Julius A. W.,  
 2433 Telegraph ave., Berkeley, Cal.  
 Luck, Louis H.,  
 198 W. Union st., Burlington, Vt.  
 Ludwig, Wm. E.,  
 1344 Dorr st., Toledo, O.  
 Luft, George W.,  
 344 West 72d st., New York, N. Y.  
 Lundgren, Ludwig Alexander Ru-  
 dolph Svante,  
 1512 Erie st., Youngstown, Ohio.  
 Lurie, James,  
 750 Lexington ave., New York, N. Y.  
 Lusk, Earl R.,  
 Jefferson & Chouteau st., St. Louis,  
 Mo.  
 Lyford, Earle H., B.A., Ph.C.,  
 63 Main st., Berlin, N. H.  
 Lyman, Rufus A., A.B., A.M., M.D.,  
 1641 S. 21st st., Lincoln, Neb.  
 Lynn, Chas. J.,  
 c. Eli Lilly & Co., Indianapolis, Ind.  
 Lyon, Arthur G.,  
 Dorrance Drug Co., Coldwater, Mich.  
 LYONS, ALBERT B.,  
 102 Alger ave., Detroit, Mich.  
 Lyons, Lucien E.,  
 Camp & Gravier sts., New Orleans,  
 La.  
 Lyons, Michael F.,  
 535 Boylston st., Boston, Mass.  
 Maas, Henry C.,  
 Bowdle, S. D.  
 Macdonald, Horace R.,  
 822 Geneva ave., Grand Rapids, Mich.  
 MacDowell, Wm. F.,  
 U.S.P.H.&M.H.S., Ellis Island, N. Y.  
 Mackelden, John Wm.,  
 2522 Clifton ave., St. Louis, Mo.

- Mackenhimer, Don G., Ph.G.,  
Lockport, Ill.
- Mackler, Max,  
387 S. Water st., New Bedford,  
Mass.
- Maggio, James I.,  
494 Spring st., W. Hoboken, N. J.
- Maguire, Edw. S., Ph.G.,  
P. H. & M. H. Service, Cleveland, O.
- Mahaffy, John A.,  
4617 Beacon st., Chicago, Ill.
- MAIN, THOS. F., PH.G.,  
166 Chambers st., New York, N. Y.
- Maines, Eugene L., M.D.,  
195 Exchange st., Rochester, N. Y.
- Maisch, Henry,  
711 Edmondson ave., Baltimore, Md.
- Maisel, Joseph,  
2278 7th ave., New York, N. Y.
- Major, Alphonse,  
461 Pearl st., New York, N. Y.
- Mall, F. A., Ph.C.,  
Belle Plain, Ia.
- Mallard, Albert E.,  
278 Woodward ave., Detroit, Mich.
- MALLINCKRODT, EDW.,  
Mallinckrodt & Main sts., St. Louis,  
Mo.
- Maltbie, Birdsey L.,  
250 High st., Newark, N. J.
- Mankin, Geo. T.,  
Falls Church, Va.
- Mann, Chas. F.,  
901 Woodward ave., Detroit, Mich.
- Mansfield, James Roy,  
1001 Jefferson st., Nashville, Tenn.
- Mansfield, Samuel,  
1001 W. Baltimore st., Baltimore, Md.
- Mansfield, Wm.,  
115 W. 68th st., New York, N. Y.
- Marckworth, Otto Stanley,  
426 Chamber of Commerce, Colum-  
bus, O.
- Marcus, Samuel,  
Residence unknown.
- Mares, Frank M., Ph.G.,  
2876 Archer ave., Chicago, Ill.
- Marianowsky, Jacob,  
310 S. 4th st., Brooklyn, N. Y.
- Marquier, Adolph F., Ph.G.,  
1041 S. Orange ave., Newark, N. J.
- Marsh, Harold,  
812 Braddock ave., Braddock, Pa.
- Marshall, Ernest C.,  
2432 Summit st., Columbus, Ohio.
- Marshall, George Gehring,  
Marshall Bldg., Cleveland, Ohio.
- Martin, Albert E.,  
P. O. Box 534, Rome, Ga.
- Martin, Albert John,  
2230 Oregon ave., St. Louis, Mo.
- Martin, John A.,  
930 15th st., Denver, Colo.
- Martin, Nicholas H.,  
Ravenswood, Gateshead-on-Tyne, Eng.
- Mason, Earl H.,  
99 Chapin ave., Providence, R. I.
- Mason, Harry B.,  
P. O. Box 484, Detroit, Mich.
- Mason, John G.,  
c. Behrens Drug Co., Waco, Tex.
- Master, Walter,  
Willow City, N. D.
- Mathews, Elmo D.,  
Recruit Depot, Ft. Logan, Colo.
- Matthews, Chas. E.,  
169 W. Franklin st., Chicago, Ill.
- Matthews, Chas. W.,  
320 Lacka ave., Scranton, Pa.
- Mattison, Richard V., M.D.,  
Ambler, Pa.
- Matusow, Harry, Ph.G.,  
300 W. Columbia ave., Philadelphia,  
Pa.
- Maukin, Virginia Turner (Mrs.),  
Thurmond, W. Va.
- Maxwell, Asa F., B.S., Ph.G.,  
1708 "B" st., Pullman, Wash.
- May, Edwin W.,  
54 W. Main st., Martinsville, Ind.
- Mayer, Joseph L., Ph.G., Ph.D.,  
340 W. 4th st., New York
- Mayer, Peter,  
111 W. State st., Marshalltown, Ia.
- Mayfield, E. Carl,  
Lafayette, Ind.
- Maynard, Heatherly, Sergt. 1st Cl.,  
H. C., Residence unknown.
- Mayo, Caswell A.,  
66 W. Broadway, New York, N. Y.
- Mayo, Fred W.,  
781 N. 7th st., Memphis, Tenn.

- McAnlis, James L.,  
230 N. Phelps st., Youngstown, O.
- McBath, William A.,  
310 W. Clinch st., Knoxville, Tenn.
- McBride, Chas. L.,  
634 Broadway, Kingston, N. Y.
- McCall, Henry,  
7 Corners, St. Paul, Minn.
- McCartney, Frank L., Phar.D.,  
Sharp & Dohme, 41 John st., New York, N. Y.
- McCauley, Charles E.,  
106 Marion st., Oak Park, Ill.
- McCausland, Harloven H.,  
C. Abbott Alkaloidal Co.,  
4753 Ravenswood ave., Chicago, Ill.
- McClallen, Edw. G.,  
7 Merchants Row, Rutland, Vt.
- McClintock, Chester W.,  
64 Woodruff ave., Columbus, O.
- McClung, E. L.,  
Natchitoches, La.
- McConkey, Charles Edgar,  
Etowah, Tenn.
- McConnell, Chas. H.,  
122 N. State st., Chicago, Ill.
- McConnell, Lewis Wm., Ph.G.,  
212 Main ave., McCook, Neb.
- McCormick, Peter J.,  
1346 Mass. ave., Cambridge, Mass.
- McDaniel, John R.,  
214 2d ave., N., Nashville, Tenn.
- McDiarmid, Daniel P.,  
371 East st., Talladega, Ala.
- McDonald, John Stedman,  
Lumberton, N. C.
- McDonnell, Herbert L., Ph.G.,  
S. E. cor. Powell & Geary sts., San Francisco, Cal.
- McELHENIE, THOS. DEARMOND, Ph.G.,  
259 Ryerson st., Brooklyn, N. Y.
- McEnroe, Robert L., S.H.C., U.S.A.,  
Residence unknown.
- McEwen, Irving,  
511 S. 35th st., Omaha, Neb.
- McFadden, Eugene A.,  
Cor. Main & Mereck sts., Hackensack, N. J.
- McFarland, William,  
Ft Yellowstone, Wyo.
- McGee, James Clyde,  
Jackson, Miss.
- McGee, Stewart Thomas, Ph.C.,  
1635 Julia st., South Berkeley, Cal.
- McGehee, W. Boyd,  
25 Dexter ave., Montgomery, Ala.
- McGill, John T.,  
Vanderbilt Univ., Nashville, Tenn.
- McGogy, James Frank,  
4727 Brooklyn ave., Seattle, Wash.
- McIntire, Charles L.,  
Perry st., St. Marys, Ohio.
- McIntire, Martin J.,  
1461 Washington st., Boston, Mass.
- McINTYRE, EWEN, JR.,  
992 6th ave., New York, N. Y.
- McKellips, Clarence,  
Northwestern Coll. of Pharm. & Dentistry, Portland, Ore.
- McKenzie, Robert H., Ph.G.,  
1701 Lawrence st., Denver, Colo.
- McKesson, Donald, B.A.,  
91 Fulton st., New York, N. Y.
- McKesson, Geo. C.,  
91 Fulton st., New York, N. Y.
- McKESSON, JOHN, JR.,  
91 Fulton st., New York, N. Y.
- McKinney, Frank Roy,  
Front st., Richmond, Maine.
- McKinney, Robert S., Ph.G.,  
Taneytown, Md.
- McLean, James W.,  
P. O. Box 557, Seattle, Wash.
- McMahon, Joseph,  
2737 E. 26th st., Sheepshead Bay, N.Y.
- McMahon, Stonewall Jackson,  
837 E. South st., Batesville, Ark.
- McMillan, Daniel N., Ph.G.,  
Elks' Club, Portland, Ore.
- McNeary, William Wilson,  
1700 Mt. Vernon st., Philadelphia, Pa.
- McNeil, Robert,  
Front & York sts., Philadelphia, Pa.
- McNeill, Wm. H.,  
River & Straight sts., Paterson, N. J.
- McNess, Fred. Wm., P.D.,  
23 Liberty st., Freeport, Ill.
- McNiff, Frank J.,  
Anthon, Ia.
- McNulty, James C.,  
1323 Brownsville Rd., Carriek, Pa.

- McRae, Emily C.,  
E. 1928 Sprague ave., Spokane, Wash.
- McTague, Edw. J.,  
2601 Jackson st., Seattle, Wash.
- Mead, Harold B.,  
110 Greenwood ave., Wyncote, Pa.
- Medlock, Chas. T.,  
2825 Live Oak st., Dallas, Tex.
- Meeker, Geo. H., B.S., M.S., Ph.D.,  
Phar.D., D.D.S., LL.D.,  
Medico-Chi College, Phila., Pa.
- Meissner, Fred. Wm., Jr., Ph.G.,  
820 Main st., La Porte, Ind.
- Melcher, George,  
Willey st., Morgantown, W. Va.
- Mellor, Alfred,  
152 W. Walnut Lane, Germantown,  
Philadelphia, Pa.
- Mendez, Rafael Martin,  
Wall st., Lares, Porto Rico.
- Menk, Chas. Wm.,  
106 Market st., Newark, N. J.
- Menzel, Max,  
Pipestone, Minn.
- Menzies, John Wm.,  
69 West ave., Buffalo, N. Y.
- Meredith, Harry L.,  
456 Summit ave, Hagerstown, Md.
- Merner, Paul Marcus P.,  
6809 York Road, Philadelphia, Pa.
- Merrell, Chas. G., S.B.,  
3595 Wilson ave., Avondale, O.
- Merrell, Geo. R.,  
6209 Wash. ave., St. Louis, Mo.
- Merrell, Hubert S., Jr., Ph.B., Ph.C.,  
4th & Market sts., St. Louis, Mo.
- Merrill, Edward C.,  
Bureau of Chemistry, Div. of Drugs,  
Washington, D. C.
- Merritt, Henry W.,  
1 So. Main st., Plains, Pa.
- Merryman, James R.,  
S. H. C., U. S. A., Phil. Division,  
U. S. A., Manila, P. I.
- Meserve, Albert W., A.M., B.A.,  
10 Main st., Kennebunk, Me.
- Messing, Richard J.,  
296 Sibley st., St. Paul, Minn.
- Metz, Abraham L.,  
Richardson Chem. Bldg., Tulane  
Univ., New Orleans, La.
- Metz, Herman A.,  
122 Hudson st., New York, N. Y.
- Metzger, Arthur S., Ph.G., Ph.C.,  
1915 Washington ave., Cairo, Ill.
- Meyer, Charles L.,  
1531 Madison ave., Baltimore, Md.
- Meyer, Fred. H.,  
3207 N. Ashland ave., Chicago, Ill.
- Meyer, Gustave H.,  
2433 7th ave., New York, N. Y.
- Meyer, Samuel,  
229 13th st., College Point, Long  
Island, N. Y.
- Meyer, Theo. F.,  
4th & Clark aves., St. Louis, Mo.
- Meyer, Walter F.,  
P. O. Box 717, Colorado City, Colo.
- Michaelis, Gus., Ph.G., Prof. Pharm.,  
541 Western ave., Albany, N. Y.
- Michalsky, John Stanislaus,  
2901 Penn ave., Pittsburgh, Pa.
- Michel, Beth Angeline,  
Baylor College of Pharmacy, Dallas,  
Texas.
- Michels, John B.,  
El Paso, Ill.
- Miersch, Rudolph Victor,  
1132 W. Broadway st., Louisville,  
Ky.
- Mierzwa, Richard,  
4724 Liberty ave., Pittsburgh, Pa.
- Mikkelson, Niels,  
Kenesaw, Neb.
- Millard, David R.,  
Baltimore & South sts., Baltimore,  
Md.
- Miller, Abraham N., Ph.D.,  
306 E. 165th st., New York, N. Y.
- MILLER, ADOLPHUS W., Ph.G., M.A.,  
Ph.D.,  
400 N. 3d st., Philadelphia, Pa.
- Miller, Albert, Ph.G.,  
2058 Lincoln ave., Chicago, Ill.
- Miller, Chas.,  
U. S. M. Hosp., Key West, Fla.
- Miller, Chas. E.,  
Albion, Ind.
- Miller, Clifford O.,  
109 N. Carey st., Baltimore, Md.
- Miller, Edwin A., B.Pd., Ph.G.,  
222 Bellevue st., Cape Girardeau, Mo.



- Miller, Emerson R., Ph.C., B.S., M.S.,  
Phar.M.,  
214 N. Murray st., Madison, Wis.
- Miller, Fred. A.,  
3641 Kenwood ave., Indianapolis, Ind.
- Miller, F. W.,  
Drawer D, Homestead, Ia.
- Miller, I. B.,  
517 Main st., Cape Girardeau, Mo.
- Miller, John Sidney,  
Rugby, N. D.
- Miller, Joy L.,  
340 Downey ave., Indianapolis, Ind.
- Miller, Turner A., Ph.G.,  
519 E. Broad st., Richmond, Va.
- Millikin, Joseph Pancoast, Ph.B., B.S.,  
Ph.C.,  
404 Quincy st., Brooklyn, N. Y.
- Minehart, John R.,  
4821 Germantown ave., Phila., Pa.
- MINER, MAURICE A., PHAR.M.,  
6446 University ave., Chicago, Ill.
- Minster-Ketter, Frederick J.,  
Auburn ave. & Saunders st., Cin-  
cinnati, O.
- Misch, Edw. F.,  
Washington ave. & 25th st., Ogden,  
Utah.
- Missildine, Ernest F., A.B.,  
Tryon, N. C.
- Mitchell, Lloyd B.,  
3401 Wendelkin st., Dallas, Tex.
- Mitschele, Albert H.,  
86 Hudson st., Hoboken, N. J.
- Mitschkun, Mark,  
576 Hastings, Detroit, Mich.
- Mittelbach, Wm., Ph.G.,  
413 5th st., Boonville, Mo.
- Moerk, Frank X., Ph.G., Ph.M.,  
145 N. 10th st., Philadelphia, Pa.
- Mohler, David C., Ph.G., Ph.L.,  
408 South Johnson st., Ada, O.
- Mollet, Chas. E. F., Ph.C.,  
523 Woodford st., Missoula, Mont.
- Monnier, Ernest,  
157 Federal st., Boston, Mass.
- Montgomery, Moses, S.H.C., U.S.A.,  
Scout Garrison, Ft. Mills, P. I.
- Montgomery, W. R.,  
140 W. Park st., Butte, Mont.
- Moore, Alexander Benjamin Jour-  
neaux, Dean Montreal College of  
Pharmacy,  
12 Winchester ave., Westmount,  
Prov. Quebec, Canada.
- Moore, John T.,  
932 Rhode Island st., Lawrence, Kan.
- Moore, W. H.,  
cor. High & Pleasant sts., Morgantown,  
W. Va.
- Morey, Arthur C.,  
1953 Beacon st., Brookline, Mass.
- MORGAN, AYLMEY L.,  
Washington & Adams sts., Camden,  
Ark.
- Morgan, Chas.,  
402 Roland ave., Roland Park, Md.
- Morgan, Frank E., Ph.G., Ph.D.,  
1629 Walnut st., Philadelphia, Pa.
- Morgan, Geo. S.,  
72 Cottage st., Pawtucket, R. I.
- Morgan, Richard Franklin,  
139 W. Oakwood Pl., Buffalo, N. Y.
- Morgan, Thos. L.,  
Pine Grove, W. Va.
- Morland, Robert L.,  
Worthington, Minn.
- Morris, Elisha Greene, Jr.,  
Athens, Ala.
- MORRIS, LEMUEL I.,  
Eddystone, Delaware Co., Pa.
- Morris, Max, Ph.G.,  
656 Cherry st., Macon, Ga.
- Morris, W. C.,  
Midway, Ky.
- Morrison, Wade B.,  
1720 Lyle ave. Waco, Tex.
- Morrisson, James W.,  
310 W. Washington st., Chicago, Ill.
- Morse, Edw. W.,  
Townly Park, Mt. Vernon, Ill.
- Mortenson, Frank E., Ph.G.,  
24th & Grand, Pueblo, Colo.
- Moseley, Jemison M.,  
Brewton, Ala.
- Moulder, Bettie L.,  
Residence unknown
- Moyer, A. E.,  
Erie, Mich.
- Mrazek, Leo Ludwig,  
1500 W. 18th st., Chicago, Ill.

- Muehlberg, Victor Charles,  
     1800 Race st., Cincinnati, O.  
 Muehlhause, Otto W.,  
     1473 Woodall st., Baltimore, Md.  
 Mueller, Ambrose,  
     Bristol Bldg., Webster Groves, Mo.  
 Mueller, Frank F.,  
     Reedsburg, Wis.  
 Mueller, J. Geo.,  
     101 S. Meridian st., Indianapolis, Ind.  
 Mueller, Otto E.,  
     1832 Baxter ave., Louisville, Ky.  
 Muench, Albert August,  
     608 N. Salina st., Syracuse, N. Y.  
 Muench, Wm.,  
     608 N. Salina st., Syracuse, N. Y.  
 Muhlhan, Otto E.,  
     10500 Cedar ave., Cleveland, O.  
 Muldoon, Hugh C., Ph.G.,  
     Mass. Coll. of Pharm., Boston, Mass.  
 Mulford, Henry K.,  
     Wayne, Pa.  
 Munson, James G.,  
     12 S. 1st st., San Jose, Cal.  
 Murphey, E. G.,  
     East Las Vegas, N. M.  
 Murphy, Dennis E.,  
     1053 S. Gregory st., Cincinnati, O.  
 Murphy, Wm. J.,  
     175 Callo Concepcion, Manila, P. I.  
 Murray, Alex., Ex.-Pres. Coll. Pharm.  
     of Costa Rica,  
     San Jose de Costa Rica, C. A.  
 Murray, Benj. L., Ph.C., B.S., A.M.,  
     c. Merck & Co., Rahway, N. J.  
 Musante, Attilio Stephen,  
     1270 Jackson st., San Francisco, Cal.  
 Muth, George G.,  
     309 N. Carey st., Baltimore, Md.  
 Muth, John C.,  
     23-25 S. Charles st., Baltimore, Md.  
 Muth, John S.,  
     23-25 S. Charles st., Baltimore, Md.  
 Myers, Preston, B.,  
     1523 Farnam st., Omaha, Neb.  
 Myerson, Isaac A.,  
     1023 Kelly st., New York, N. Y.  
 Nagle, Edward G.,  
     92 Coolidge st., Brooklyn, Mass.  
 Nance, Oscar J.,  
     Jackson, Tenn.  
 Neal, Chas. C.,  
     301 W. Pratt st., Baltimore, Md.  
 Nebig, Wm. G., Ph.G.,  
     2143 N. 18th st., Philadelphia, Pa.  
 Needham, Robert H.,  
     623 Payntz, Manhattan, Kansas.  
 Nelligar, Fred D.,  
     400 Church st., Norfolk, Va.  
 Nelson, Edwin H.,  
     Brooklyn & Lafayette aves., Detroit,  
     Mich.  
 Nelson, Rasmus Peter,  
     Ft. Mills, Corregidor Island, P. I.  
 Neptune, Campbell A.,  
     600 Market st., Parkersburg, W. Va.  
 Nesbitt, Evelyn (Mr.),  
     597 Sherbrooke st., Winnipeg, Man.,  
     Can.  
 Nester, Herman A., Ph.G.,  
     529 San Pedro ave., San Antonio, Tex.  
 Neu, Daniel A.,  
     423 Summit ave., West Hoboken, N. J.  
 Nevin, Thos.,  
     35 W. 33d st., New York, N. Y.  
 Newcomb, Edwin L., P.D.,  
     719 6th ave., S. E., Minneapolis, Minn.  
 Newhall, Bert A.,  
     2337 Western Parkway, Louisville, Ky.  
 Newman, Emanuel,  
     Sgt. 1st Cl.H.C., (retired),  
     c. Dept. Surgeon's Office, Ft. Santi-  
     ago, Manila, P. I.  
 NEWMAN, GEO. A.,  
     1123 3d st., Louisville, Ky.  
 Newton, Howard C.,  
     c. Creighton College of Pharmacy,  
     Omaha, Neb.  
 Newton, Robert A.,  
     Southboro, Mass.  
 Nichols, Clarence Van Buren,  
     408 E. Main st., Anadarko, Okla.  
 Niece, Fred E., Ph.G., Ph.C., Phar.D.,  
     Lynn ave., Queens, N. Y.  
 Nielson, John,  
     Ortonville, Minn.  
 Niles, Edward Hulbert,  
     725 Century Bldg., Indianapolis,  
     Ind.  
 Nitardy, Ferd. Wilhelm, Ph.G., Ph.C.,  
     1418 Cherokee st., Denver, Colo.

- Nixon, Chas. F., Ph.G.,  
No. 1 Park st., Leominster, Mass.
- Noaks, Richard S.,  
National Cemetery, City Point, Va.
- Noll, Martin J., Ph.G.,  
11 So. 4th st., c. Eli Lilly, St. Louis,  
Mo.
- Noll, Mathias, Ph.C.,  
627 Commercial st., Atchison, Kans.
- Nooner, Thompson A.,  
173 E. 2d st., Fond-du-Lac, Wis.
- Norman, John F.,  
1026 7th st., N., Fargo, N. D.
- North, Herman Harold,  
164 Grant ave., Jersey City, N. J.
- Norton, Geo. E.,  
102 River st., Cambridge, Mass.
- Noyes, Chas. R., B.A.,  
c. Noyes Bros. & Cutler, St. Paul,  
Minn.
- Nudd, Benjamin F., Sgt. 1st Cl., H.C.,  
Field Hospital, No. 5, Texas City,  
Texas.
- Nywall, David A., B.S., Ph.G.,  
Scandia, Kans.
- Oats, Henry E.,  
659 Ninth ave., New York, N. Y.
- O'Brien, James M.,  
3730 Washington st., Boston, Mass.
- O'Brien, James S.,  
424 6th ave., Pittsburgh, Pa.
- O'Gorman, Theophilus,  
P. O. Box 608, San Jose, Calif.
- O'Hare, James, P.D.,  
654 N. Main st., Providence, R. I.
- O'NEIL, HENRY M.,  
314 W. 14th st., New York, N. Y.
- O'Rourke, Francis Jos.,  
12 No. 8th ave., Whitestone, N. Y.
- Osefe, Felix von, M. D.,  
326 E. 58th st., New York, N. Y.
- Oglesby, Robert McGrady,  
Bartow, Fla.
- OHLLIGER, LOUIS P.,  
75 Medbury ave., Detroit, Mich.
- Ohliger, Willard,  
75 Medbury ave., Detroit, Mich.
- OLESON, OLAF M.,  
Ft. Dodge, Ia.
- Olive, Geo. M.,  
1865-1867 Mass. ave., N. Cambridge,  
Mass.
- OLIVER, WM. M.,  
132 Broad st., Elizabeth, N. J.
- Olshin, Meyer David,  
114 Congress st., Newark, N. J.
- Olson, Ferdinand P.,  
Box 85, Mobridge, S. Dak.
- Orr, Charles C.,  
541 E. 112th st., Chicago, Ill.
- Osborne, Melmoth M.,  
Elkins Park, Pa.
- Osborne, Wm., Jr.,  
P. O. Box 304, Presque Isle, Me.
- Osseward, Cornelius, Ph.C.,  
Cobb Bldg., Seattle, Wash.
- Osterlund, Otto Wm.,  
46th st. & Balto. ave., Philadelphia, Pa.
- Osterman, Henry,  
122 So. Walnut st., Seymour, Ind.
- Ostrosky, Frank J.,  
646 Pembroke st., Bridgeport, Conn.
- Ostrum, Hyman W.,  
108 W. Girard ave., Philadelphia, Pa.
- Otis, John C.,  
S. W. Cor. Ruth and Gilbert, Wal-  
nut Hills, Cincinnati, O.
- Ott, Bertha (Miss),  
Reading Road & Oak st., c. Bethesda  
Hospital, Cincinnati, Ohio.
- Otto, Theo. G. E.,  
402 Washington st., Columbus, Ind.
- Oxman, Herman Harrison, Ph.G.,  
14 West 118th st., New York, N. Y.
- Paar, Albert Rheinhardt,  
51 W. Frambes ave., Columbus, O.
- Pachali, Theo., Jr.,  
1501 Locust st., Philadelphia, Pa.
- Packard, Chas. H.,  
7 Central Sq., E. Boston, Mass.
- Palmer, James Clarence,  
4760 21st ave., N. E., Seattle, Wash.
- Palmer, Wm. G.,  
Fowler, Colo.
- Paris, James E., Ph.G.,  
108 Pruett st., Paragould, Ark.
- Paris, William John James,  
Roselare, Ill.
- Parisen, Geo. W.,  
321 High st., Perth Amboy, N. J.

- Parker, Claude H.,  
U. S. Marine Hospital, St. Louis, Mo.
- Parker, Fred M.,  
364 Wabash ave., St. Paul, Minn.
- Parker, Gilbert R.,  
22 Pocasset ave., Providence, R. I.
- Parker, Mayne E.,  
1902 Bellefontaine st., Indianapolis,  
Ind.
- Parsons, Geo. L., Ph.G.,  
Keokuk, Ia.
- Partridge, Frank R.,  
Water st., Augusta, Me.
- PATCH, EDGAR L., Ph.G.,  
28 Lincoln, Stoneham, Mass.
- Patch, James A.,  
Syrian Prot. College, Beirut, Syria.
- Patterson, Annie M.,  
631 Euclid ave., Roland Park, Balti-  
more, Md.
- Patterson, Chas. W.,  
6539 Greenwood ave., Chicago, Ill.
- Patterson, Geo. O., Ph.G.,  
Hawesville, Ky.
- Patterson, Theo. H.,*  
3640 Cottage Grove ave., Chicago, Ill.
- Patton, John F.,  
273 W. Market st., York, Pa.
- Paul, Geo. H.,  
Ft. Columbia, Wash.
- Pauley, Alfred Washington,  
3130 N. Grand ave., St. Louis, Mo.
- PAULEY, FRANK C.,  
939 Ailanthus ave., St. Louis, Mo.
- Payne, Geo. F., M.D.,  
50 Bonaventure ave., Atlanta, Ga.
- Payne, Winfield Scott, B.A.,  
301 E. 7th ave., Denver, Colo.
- Peacock, Bertha L. (Mrs.), Ph.G.,  
Erie & Broad sts., Ger'n, Philadelphia,  
Pa.
- Peacock, Josiah C., Ph.G.,  
Erie & Broad sts., Philadelphia, Pa.
- Pearce, Geo. E.,  
21 West Union, Frostburg, Md.
- Pearce, Howard A.,  
370 Elmwood ave., Providence, R. I.
- Pearre, Albert L.,  
18 S. Market st., Frederick, Md.
- Pearson, Joseph F., C. Ph. U. S. N.,  
272 King George st., Annapolis, Md.
- Pearson, Wm. A.,  
209 N. 50th st., Philadelphia, Pa.
- Pease, Autumn V.,  
408 Fourth st., Fairbury, Neb.
- Pegg, Harry W., Ph.G.,  
887 Market st., Kingston, Pa.
- Pellerano, Nicholas A.,  
35 South 1st st., San Jose, Cal.
- Pendleton, Clarence Isaac,  
114 Hillside Road, Watertown, Mass.
- Penick, Douglas McGill,  
918 Commerce st., Lynchburg, Vt.
- Penick, S. Barksdale,  
Marion, N. C.
- Perrin, D. Edmund,  
14th & Warren ave., W., Detroit, Mich.
- Perry, Fred W. R., Ph.C.,  
709 Woodward ave., Detroit, Mich.
- Perry, Henry Wm.,  
529 Medford st., Winter Hill sta.,  
Somerville, Mass.
- Person, Thomas,  
Post Hosp., Ft. Hunt, Va.
- Perusse, Francis Joseph,  
2740 Arlington ave., Lincoln, Neb.
- Peters, Henry A., M.D., Ph.G.,  
200 N. Main st., Oconomowoc, Wis.
- Peterson, Alex F.,  
216 Higgins ave., Missoula, Mont.
- Petsche, Franz F. B. W.,  
Arlington Chem. Co., Yonkers, N. Y.
- Petterson, Ernst, W.,  
25 S. Palafox st., Pensacola, Fla.
- Peyton, Joe Wharton,  
500 Texas st., Shreveport, La.
- Pfafflin, Henry A.,  
2729 N. Pennsylvania ave., Indian-  
apolis, Ind.
- Pfeiffer, Gustavus A.,  
639 N. Broad st., Philadelphia, Pa.
- Philip, Waldemar Bruce,  
1410 Fruitvale ave., Fruitvale, Cal.
- Pickhardt, Elsa Grace (Miss),  
1042 Madison ave., New York, N. Y.
- Pieck, Edw. L.,  
6th & Main sts., Covington, Ky.
- Piel, Warner A.,  
1802 Farnam st., Omaha, Neb.
- Pierce, Fred D.,  
Barton, Vt.



- PIERCE, WM. H.,  
 316 Shawmut ave., Boston, Mass.  
 Pierson, Romaine,  
 81-83 Fulton st., New York, N. Y.  
 Pillsbury, Arthur Lee,  
 Box 1702, Denver, Colo.  
 Pinkerton, Howard,  
 81 Grand River ave., Detroit, Mich.  
 Pinkerton, M. E. (Mrs.),  
 179 National ave., Detroit, Mich.  
 Pirie, Alfred M.,  
 Cartago, Calle Real, Costa Rica, C. A.  
 Pirtle, Virgil Earl,  
 Bonne Terre, Mo.  
 Piszczek, Theodore A.,  
 948 Forest Home ave., Milwaukee, Wis.  
 PITT, JOHN R.,  
 218 Main st., Middletown, Conn.  
 Pittenger, Paul S., Ph.G., Ph.C.,  
 Phar.D.,  
 426 S. 13th st., Philadelphia, Pa.  
 Placak, Harry, Ph.G.,  
 3039 Woodland ave., Cleveland, O.  
 Plaut, Albert,  
 120 William st., New York, N. Y.  
 Plenge, Henry,  
 8 Broad st., Charleston, S. C.  
 Poehner, Adolph Adam, Ph.G., M.D.,  
 1517b Golden Gate ave., San Fran.,  
 Cal.  
 Poley, Warren H.,  
 33 E. Upsal st., Mt. Airy, Phila., Pa.  
 Pollard, Augustus T.,  
 239 S. 11th st., Philadelphia, Pa.  
 Polonsky, Evel, Ph.G.,  
 163 Broadway, Buffalo, N. Y.  
 Porro, Alvaro,  
 17 San Francisco, Camaguey, Cuba.  
 Porter, Chilton Scott,  
 430 E. Maxwell st., Lexington, Ky.  
 Porter, G. Ellis, A.B.,  
 c. Porter's Pharm., Cor. 8th &  
 Orange st., Riverside, Cal.  
 PORTER, HENRY C.,  
 Main & Pine sts., Towanda, Pa.  
 Porter, Jesse G.,  
 Tipton, Ind.  
 Porter, Martin L., M.D.,  
 Danforth, Me.  
 Porter, Wm. P.,  
 Belgrade, Montana.  
 Porterfield, Wm. P., Ph.G.,  
 61 Broadway, Fargo, N. D.  
 Portmann, Leo. E.,  
 613 Sandal st., Canton, O.  
 Posey, Henry Gibson,  
 Cor. Hurst & Webster sts., New  
 Orleans, La.  
 Potter, Maynard H., Ph.G., Ph.C.,  
 Piggott, Ark.  
 Potts, G. H.,  
 561 Trumbull ave., Detroit, Mich.  
 Potts, Thos. H.,  
 Room 439, 122 S. Michigan Blvd.,  
 Chicago, Ill.  
 Powell, Fred A.,  
 430 N. Court st., Circleville, Ohio.  
 Powell, Muzelle,  
 Klemme, Iowa.  
 Powell, Wm. C.,  
 119 Green st., Snow Hill, Md.  
 POWER, FREDERICK B.,  
 535 Warren st., Hudson, N. Y.  
 Powers, Emmett,  
 919 E. 25th ave., Denver, Colo.  
 Price, Walter C.,  
 c. Huntington Drug Co.,  
 Huntington, W. Va.  
 Prince, Clofton O.,  
 Winchester, Tenn.  
 Prior, Toney,  
 282 San Jose ave., San Francisco, Cal.  
 Pritchard, Benj. E.,  
 918 Bessemer Bldg., Pittsburgh, Pa.  
 Provost, Frederic Talmage,  
 1155 Wilson ave., Chicago, Ill.  
 Pruden, Floyd E., Ph.G.,  
 P. O. Box 202, Quanah, Tex.  
 Pruett, Albert Roberts,  
 Arlington, Ga.  
 Pruyn, Murry K.,  
 1527 N. La Salle st., Indianapolis, Ind.  
 Puckner, Wm. A., Ph.G., Phar.D.,  
 535 Dearborn ave., Chicago, Ill.  
 Pully, Luther S.,  
 1621 Church st., Nashville, Tenn.  
 Putt, Earl B.,  
 Food & Drug Laby., 641 Washington  
 st., New York, N. Y.  
 Quackenbush, Benj. F.,  
 703 Greenwich st., New York, N. Y.

- Quigley, Richard L.,  
 2036 G st., N. W., Washington, D. C.  
 Rabak, Frank,  
 Bu. Plant Industry, Washington, D. C.  
 Rabenstein, Edward, Jr.,  
 4060 Superior av., Cleveland, O.  
 Rabinowitz, Wm. J.,  
 333 State st., Brooklyn, N. Y.  
 Rabinson, Saul M., Phar.D.,  
 640 Broadway, Brooklyn, N. Y.  
 Rauber, Edw. G.,  
 49 Biddle st., Milwaukee, Wis.  
 Ramirez, Rogelio H., M.D.,  
 Real 170, Mariano, Cuba.  
 Ramsaur, David W.,  
 201 Lemon st., Palatka, Fla.  
 Ramsey, Clarence F.,  
 344 Field ave., Detroit, Mich.  
 Randolph, Raymond B. F.,  
 State Lab. of Hygiene, Trenton, N. J.  
 Rapelye, Charles A.,  
 Hartford, Conn.  
 Raubenheimer, Otto, Ph.G.,  
 1341 Fulton st., Brooklyn, N. Y.  
 Rauschfleisch, Edward C.,  
 13419 Euclid ave., Cleveland, O.  
 Ray, Clifford W.,  
 Jaeger, W. Va.  
 Raycraft, Joseph Winfred,  
 702 Jackson st., Springfield, Ill.  
 Read, Harry A.,  
 529 Dean st., Brooklyn, N. Y.  
 Ream, William Arthur,  
 304 High st., Morgantown, W. Va.  
 Rebustillo, Manuel G.,  
 P. O. Box 14, Oriente, Manzanillo,  
 Cuba.  
 Redfern, Ellsworth L., B.S.,  
 c. State Dairy & Food Commission,  
 Des Moines, Ia.  
 Reed, James G.,  
 13882 Euclid ave., East Cleveland, O.  
 Reese, David J.,  
 17th & Huntingdon sts.,  
 Philadelphia, Pa.  
 Regan, John Perley,  
 Ramblers Way, No. Weymouth, Mass.  
 Rehfeld, Gustav,  
 4314 Wash. ave., St. Louis, Mo.  
 Reh fuss, Chas.,  
 1301 Columbus ave., Philadelphia, Pa.  
 Reh fuss, Jacob H.,  
 252 Sumner ave., Brooklyn, N. Y.  
 Reichert, Louis, Jr.,  
 418 Library st., Braddock, Pa.  
 Reid, Alexander,  
 87 Henry st., Detroit, Mich.  
 Reif, Earnest,  
 1251 N. Second st., Philadelphia, Pa.  
 Reilly, Robert C.,  
 4201 S. Vermont, Los Angeles, Cal.  
 Reimann, Geo.,  
 405 Genesee st., Buffalo, N. Y.  
 Rein, Tania,  
 1321 First st., Seattle, Wash.  
 Reiner, Nicholas F.,  
 1 Westminster st., Providence, R. I.  
 Reiser, Philip,  
 588 Carman st., Camden, N. J.  
 REMINGTON, JOSEPH P.,  
 1832 Pine st., Philadelphia, Pa.  
 Remus, Wm. J.,  
 127 So. Grave ave., Grand Rapids,  
 Mich.  
 Rennie, Robert W.,  
 771 Third ave., Detroit, Mich.  
 Reum, Arthur Wm.,  
 1291 Stanyan st., San Francisco, Cal.  
 Reyer, Emil, Ph.G.,  
 614 Portage ave., South Bend, Ind.  
 Rhea, Howard M.,  
 Somerville, Tenn.  
 Rhode, Rudolph E.,  
 1301 N. Clark st., Chicago, Ill.  
 Rhodes, George W.,  
 Newark, Del.  
 Rice, Herbert E.,  
 55 Main st., Nashua, N. H.  
 Rich, Wm. P.,  
 Pros. & Pease aves., Verona, N. J.  
 Richardson, Frank, Ph.G.,  
 Cambridge, N. Y.  
 Richardson, Willard S.,  
 14th & R sts., N.W., Washington, D.C.  
 Richtmann, Wm. O., Ph.G., B.S.,  
 Satsuma Heights, Fla.  
 Ridgway, Lemuel A.,  
 Residence unknown.  
 Riefflin, Geo. T.,  
 41 John st., New York, N. Y.  
 Riemenschneider, J. H.,  
 2916 Broadway, Chicago, Ill.

- Riesen, David V.,  
Marysville, Kans.
- Riestein, Albert G.,  
488 Cass ave., Detroit, Mich.
- Rietzke, Herman W.,  
380 Selby ave., St. Paul, Minn.
- Riley, John A.,  
Residence unknown.
- Rinker, Oscar O.,  
230 E. Russell st., Columbus, O.
- Ripley, Henry M.,  
531 Main st., Melrose, Mass.
- Rippetoe, John R., P.D.,  
570 E. 133d st., New York, N. Y.
- Riter, Benj. F.,  
33 N. Main st., Logan, Utah.
- Roach, Edna Winnifred,  
Lyman, Wash.
- Roberts, John Griffith,  
35 Poplar st., Philadelphia, Pa.
- Roberts, Joseph C.,  
24 E. Woodland ave., Arlington, Md.
- Robertson, David, Sgt. H.C., U.S.A.,  
Hd. E. Div., Governor's Island, N. Y.
- ROBINSON, JAMES S.,  
2d & Madison sts., Memphis, Tenn.
- Robinson, Kenneth Nye,  
121 West Gay st., Warrensburg, Mo.
- Robinson, Thomas Aubrey,  
Main & Madison sts., Memphis, Tenn.
- Robitshek, Irving H.,  
86 So. 10th st., Minneapolis, Minn.
- Rockefeller, Howard,  
24 West Park st., Butte, Mont.
- Rodemoyer, Wm. E.,  
773 Hazelwood ave., Pittsburgh, Pa.
- Rodgers, Edw. J.,  
1217 Pine Grove ave., Port Huron,  
Mich.
- Roe, Joseph N.,  
College & Jefferson, Valparaiso, Ind.
- Roe, Roy C.,  
709 S. Winchester ave., Chicago, Ill.
- Roediger, Louis F., Ph.G.,  
46 Market st., New York, N. Y.
- Roehr, Clarissa M. (Miss),  
2d & Parnassus ave., U. H., San  
Francisco, Cal.
- Rochrig, Albert M., Ph.G.,  
Pharm. U. S. Pub. Health Service,  
U. S. M. Hosp., Buffalo, N. Y.
- Roemer, John, O.P.,  
144 Railroad ave., White Plains, N. Y.
- Rogers, Blanche I.,  
Solon, Iowa
- Rogers, Charles Herbert,  
West Va. Univ., Morgantown, W. Va.
- Rogers, Edw.,  
U. S. M. H., San Francisco, Cal.
- Rogers, Fred S.,  
30 North st., Middletown, N. Y.
- ROGERS, WM. H.,  
North st., Middletown, N. Y.
- Rogoff, Julius M., M.D.,  
Med. Dept., Vanderbilt Univ., Nash-  
ville, Tenn.
- Rohnert, Frederick,  
455 Jefferson ave., Detroit, Mich.
- Rohrman, Frank Randall,  
4603 Wayne ave., Philadelphia, Pa.
- Rollins, William Cleveland,  
Madill, Okla.
- Roon, Leo,  
Broadway & Baxter ave., Elmhurst,  
L. I.
- Root, Wilfred F.,  
63 Main st., Brattleboro, Vt.
- Rose, Ernest Wm.,  
3032 Olive st., St. Louis, Mo.
- Rose, Ira W., Ph.G.,  
102 N. Main st., Rocky Mountain,  
N. C.
- Rosengarten, Adolph G.,  
9th & Parrish sts., Philadelphia, Pa.
- Rosengarten, Frederick,  
9th & Parrish sts., Philadelphia, Pa.
- Rosengarten, Geo. D.,  
P. O. Box 1625, Philadelphia, Pa.
- Rosengarten, J. G.,  
9th & Parrish sts., Philadelphia, Pa.
- Rosenthal, David A., Ph.G.,  
Gay & Clinch sts., Knoxville, Tenn.
- Rosenzweig, Benj.,  
The Lakewood, 495 8th ave., Brooklyn
- Rosin, Joseph,  
9th & Parrish sts., Philadelphia, Pa.
- Ross, Otto E., Ph.C., Ph.G.,  
Conde, S. D.
- Rousseau, Joe C.,  
Sergt. H. C., U. S. A. Aviation  
Squadron, Signal Corps, San Diego,  
Cal.

- Rothwell, Walter,  
Hathoro, Pa.
- Rowlinski, Robert A.,  
Box 595, Savannah, Ga.
- Rubenstein, Louis,  
218 Cherry st., Seattle, Wash.
- Rudd, Cicero,  
Lineville, Ala.
- Rudder, Wm. H.,  
3 Lyons Block, Salem, Ind.
- Ruddiman, Edsel, A., Ph.C., Ph.D.,  
M.D.,  
101 24th ave., S., Nashville, Tenn.
- Ruenzel, Henry G.,  
2332 Vliet st., Milwaukee, Wis.
- Ruf, Frank A.,  
1624 Pine st., St. Louis, Mo.
- Ruhl, Harry F.,  
Manheim, Lancaster Co., Pa.
- RUNYON, EDWARD W.,  
11 W. 42d st., New York, N. Y.
- Rupert, Jonas F.,  
H. S., U. S. Naval Hosp., Las Animas, Colo.
- Ruppe, Bernard C.,  
203 W. Central ave., Albuquerque, N. M.
- Rusby, Henry H.,  
776 De Graw ave., Newark, N. J.
- Ryan, Alonzo S.,  
1001 16th st., Denver, Colo.
- Ryan, Ambrose E.,  
P. O. Box 93, El Paso, Tex.
- Ryan, Frank G.,  
c. Parke Davis & Co., Detroit, Mich.
- Ryer, Jos. S.,  
1575 Genesec st., Buffalo, N. Y.
- Ryus, Floyd E.,  
Ketchikan, Alaska.
- Saalbach, Carl, Ph.G.,  
1436 5th ave., Pittsburgh, Pa.
- Saalbach, Louis, Ph.G., Ph.D.,  
1436 5th ave., Pittsburgh, Pa.
- Sabin, Geo. C.,  
Grants' Pass, Ore.
- Saccar, Michael, Ph.G.,  
City Drug Store, Hallettsville, Tex.
- Sadtler, Samuel P.,  
39 S. 10th st., Phila., Pa.
- Sahm, Louis N.,  
c. Heller & Merz Co., 505 Hudson st., New York, N. Y.
- Sala, Albert F.,  
114 W. Wash'n st., Winchester, Ind.
- Samson, Max,  
117 Camp st., New Orleans, La.
- Sand, Jerome B.,  
428 Union st., Nashville, Tenn.
- Sandles, Van Amburg,  
1000 Charles ave., McKees Rock, Pa.
- Sanger, John Alphonse,  
4101 St. Louis ave., St. Louis, Mo.
- Saphiro, Isadora,  
173 Ave. B, New York, N. Y.
- Sarra, Ernesto,  
41 Teniente Rey st., Havana, Cuba.
- Sass, Stephen K.,  
1725 W. 18th st., Chicago, Ill.
- Sauerbrun, Otto O.,  
366 S. 4th st., Columbus, O.
- Saunders, Wm. H., Ph.C.,  
281 Talbot ave., Dorchester, Mass.
- Sauvinet, Chas. D.,  
Cor. 9th & Vermont, Los Angeles, Cal.
- Sawyer, John R.,  
367 Centre st., Boston, Mass.
- SAYRE, EDW. A.,  
100 Henry st., Orange, N. J.
- Sayre, Lucius E.,  
Univ. of Kans., Lawrence, Kans.
- Scallin, Stephen H.,  
Mitchell, S. D.
- Schaak, Milton F.,  
108 Penn st., Brooklyn, N. Y.
- Schachleiter, Francis G.,  
717 Central ave., Hot Springs, Ark.
- Schadt, Conrad, R.P.,  
Amana, Ia.
- Schaefer, Chas. H., Ph.G.,  
3906 Perrysville ave., Pittsburgh, Pa.
- Schaefer, Emil A., P.D.,  
1436 5th ave., Pittsburgh, Pa.
- Schaefer, Laura (Miss),  
514 Ave. C, San Antonio, Tex.
- SCHAFER, GEO. H.,  
713 Front st., Ft. Madison, Ia.
- Schapper, Ferdinand C.,  
192 N. Clark st., Chicago, Ill.
- Schaupner, John Philip,  
399 Linwood ave., Detroit, Mich.



- Scheips, Theo. I.,  
143 N. Wabash ave., Chicago, Ill.
- Schellentrager, Ernst A.,  
3361 St. Clair ave., N.E., Cleveland, O.
- Schenck, Fannie K. (Mrs.),  
1321 Broadway, Denver, Colo.
- Schenck, Henry,  
45 Park Place, New York, N. Y.
- Scherer, Andrew, Ph.G.,  
1201 N. State st., Chicago, Ill.
- SCHERLING, GUSTAV, Ph.G.,  
1201 4th st., Sioux City, Ia.
- Schettler, Geo. M.,  
55 W. Fort St., Detroit, Mich.
- Scheuber, Frank A.,  
Livingston, Mont.
- Schieffelin, Wm. Jay, M.D.,  
170 William st., New York, N. Y.
- Schiess, Benedict Frederick,  
914 N. 19th st., St. Louis, Mo.
- Schiff, Ludwig,  
c. Western Wholesale Drug Co.,  
Los Angeles, Cal.
- Schimpf, Henry Wm.,  
443 W. 34th st., New York, N. Y.
- Schindel, David P.,  
47 So. Potomac st., Hagerstown, Md.
- Schlabach, Cyrus L.,  
437 Northampton st., Easton, Pa.
- Schlesinger, Leopold J.,  
109 Ashburton ave., Yonkers, N. Y.
- Schlichting, Arthur Floyd,  
Agricultural College, North Dakota.
- Schlicke, Carl Paul,  
440 Washington st., New York, N. Y.
- Schlösser, Peter,  
639 Second st., Louisville, Ky.
- Schlotterbeck, Augustus G.,  
36 Brown st., Portland, Me.
- SCHLOTTERBECK, JULIUS O.,  
907 Lincoln ave., Ann Arbor, Mich.
- Schlueter, Robert E., Ph.G., M.D.,  
909 Park ave., St. Louis, Mo.
- Schlumberger, Anna B.,  
Denison, Ia.
- Schlumberger, Philip A.,  
122 Broadway, Denison, Ia.
- Schmid, Rose P.,  
2133 S. Halsted st., Chicago, Ill.
- Schmidt, Fred. M., Ph.G.,  
5 S. Wabash ave., Mallers Bldg.,  
Chicago, Ill.
- Schmidt, Henry,  
501 Elizabeth ave., Elizabeth, N. J.
- Schmidt, Maurice R.,  
720 W. 181 st., New York, N. Y.
- Schmidt, Valentine,  
1845 Polk st., San Francisco, Cal.
- Schmitman, Henry,  
2438 E. 61st st., Cleveland, O.
- Schmitter, Jonathan,  
Maple st., Gypsum City, Saline Co.,  
Kansas.
- Schnaidt, Henry J.,  
Parkston, S. D.
- Schneider, Albert, B.S., M.S., M.D.,  
Ph.D.,  
723 Pacific Bldg., San Francisco, Cal.
- Schnell, Harry J.,  
100 William st., New York, N. Y.
- Schoder, Carl Eugene,  
913 Corona st., Denver, Colo.
- Schoenhut, Christian H.,  
410 Superior st., Cleveland, O.
- Schoenthaler, John P.,  
3459 Magnolia ave., St. Louis, Mo.
- Scholtz, Edmund L.,  
1001 16th st., Denver, Colo.
- Scholtz, William O.,  
1001 16th st., Denver, Colo.
- Scholz, Oscar R. B.,  
131 Hamburg Place, Newark, N. J.
- Schott, Ernest J.,  
R. R. No. 2, Nashville, Tenn.
- SCHRANCK, HENRY C.,  
49-55 Biddle st., Milwaukee, Wis.
- Schreiner, Albert,  
8 Wilson st., Batavia, Ill.
- Schreiner, Albert, Jr.,  
8 Wilson st., Batavia, Ill.
- Schrodt, Jacob, Ph.G.,  
2000 Elm st., Cor. Harwood,  
Dallas, Tex.
- Schueller, Fred. Wm.,  
232 S. High st., Columbus, O.
- Schuh, Paul G.,  
607 Commercial ave., Cairo, Ill.
- Schultheis, Raymond,  
Cuartel de Espana, Manila, P. I.

- Schultz, Chas. F. W.,  
159 Chicago st., Elgin, Ill.
- Schultz, John J.,  
1109 Tippecanoe st., Lafayette, Ind.
- Schultz, William Henry,  
128 Willey st., Morgantown, W. Va.
- Schulz, Emiel,  
S. 1st C. H. C., U. S. A., Ft. Flagler, Washington.
- Schulz, Henry L.,  
1607 Transportation Bldg., c. U. S. Food & Drug Lab., Chicago, Ill.
- Schulze, Louis, Ph.G.,  
Patterson Pk. & Eastern ave., Baltimore, Md.
- Schumann, Henry V.,  
New Braunfels, Tex.
- Schumann, Otto G.,  
837 N. Caroline st., Baltimore, Md.
- Schwartz, Israel,  
503 E. 7th st., Brooklyn, N. Y.
- Schwartz, Maurice P.,  
1026-30 Kentucky ave., Indianapolis, Ind.
- Schweinfurth, Geo. E.,  
866 6th ave., New York, N. Y.
- Schwerdtmann, Theo. Robert,  
West End Hotel, St. Louis, Mo.
- Scott, Alex. W.,  
115 E. Mountain ave., Ft. Collins, Colo.
- Scott, Clarence A.,  
Prattville, Ala.
- Scott, Edgar B.,  
109 Maryland ave., N. E., Washington, D. C.
- Scott, Harry,  
636 Park ave., New York, N. Y.
- Scott, S. M., Jr.,  
Terra Alta, W. Va.
- Scoville, Wilbur L.,  
81 Melbourne ave., Detroit, Mich.
- Scully, James A., Sgt.,  
1st Cl. H. C., U. S. A., Ft. Meyer, Va.
- Seaman, Fred. A.,  
229 Rector st., Perth Amboy, N. J.
- Sears, Chas. B.,  
109 Genesee st., Auburn, N. Y.
- Secheverell, Hugh B.,  
3658 Navajo st., Denver, Colo.
- Seeley, Milton J.,  
Manton, Mich.
- Seibert, Geo. F.,  
333 Stephenson ave., Iron Mountain, Mich.
- Seiberz, John J.,  
Shelby & Camp., Louisville, Ky.
- Seidman, Harry,  
627 N. 2d st., Philadelphia, Pa.
- Seinsoth, John J.,  
11 Main st., Hartford, Conn.
- Seith, Louis F.,  
Sgt. 1st Cl. H. C., U. S. A., Military Hospital, Zamboango, Mindanao, P. I.
- Seitz, Lorenz A.,  
736 S. 4th st., St. Louis, Mo.
- Seltzer, Leonard A., PhC.,  
32 Adams st., W., Detroit, Mich.
- Selzer, Eugene R., Ph.C.,  
1600 E. 117th st., Cleveland, O.
- Selzer, Mary E. (Mrs.),  
Meno Park, Cal.
- Semones, Wm. L.,  
14 Market Square, Knoxville, Tenn.
- Senecal, Henry C.,  
S. 1st Cl. H. C., U. S. A., c. Chief Surgeon, Manila, P. I.
- Sennewald, Emil A.,  
3501 McKean st., St. Louis, Mo.
- Sethness, C. Henry,  
718 Curtis st., Chicago, Ill.
- Seydler, Robert,  
Bomarton, Tex.
- Seyfert, Paul,  
Thiensville, Wis.
- Seymour, James,  
1653 Marion st., Denver, Colo.
- Shaak, Franklin P.,  
95 Elm st., Kearney, N. J.
- Shackelford, Hilary S.,  
Wynnewood, Okla.
- Shannon, Fern L.,  
Dairy & Food Dept., Lansing, Mich.
- Shannon, Thomas J.,  
7 Main st., Sharon, Tenn.
- SHARPLESS, STEPHEN P., S.B.,  
26 Broad st., Boston, Mass.
- Sheblessy, Michael A.,  
3459 Indiana ave., Chicago, Ill.

- Shedd, Edwin W.,  
69 Boston ave., W., Bedford, Mass.
- Shepard, Henry C.,  
S. E. Cor. Public Sq., Shelbyville,  
Tenn.
- SHEPPARD, SAMUEL A. D.,  
1129 Washington st., Boston, Mass.
- Sher, Edward,  
1344 Park ave., New York, N. Y.
- Sherman, Chas. R.,  
102 S. 16th st., Omaha, Neb.
- Sherrard, Chas. C.,  
Box 588, Angola, Ind.
- Sherriff, Wm. E.,  
Douglass ave., Ellsworth, Kans.
- Sherwood, Henry J.,  
2064 E. 9th ave., Cleveland, O.
- Shipe, Columbus A. (Miss),  
San Marcos, Texas.
- Shnitter, Adolf, Ph.G.,  
1230 Boston Road, Bronx, N. Y.,  
N. Y.
- SHOEMAKER, RICHARD M.,  
4th and Race sts., Philadelphia, Pa.
- Showalter, Ralph W.,  
3338 N. Illinois st., Indianapolis, Ind.
- Shreve, John A.,  
Main st., Port Gibson, Miss.
- Shugers, Walter R.,  
Auburn, Ind.
- Shull, George J.,  
Sergt. 1st Cl. Hosp. Corps, U. S.  
A., Ft. Thomas, Ky.
- Shulman, Jacob A.,  
1403 E. Pratt st., Baltimore, Md.
- Shulmyer, Charles Joseph,  
291 California ave., Providence, R. I.
- Shultz, Martin Elliott,  
Punta Rassa, Fla.
- Shurtleff, Frank Hamilton,  
278 Dartmouth st., Boston, Mass.
- SHURTLEFF, ISRAEL H.,  
195 4th st., New Bedford, Mass.
- Siedler, August,  
Sergt. 1st Cl. H. C., U. S. A., Ft.  
William McKinley, P. I.
- Siegel, Harry J.,  
519 J. st., Sacramento, Calif.
- SIEGENTHALER, HARVEY N.,  
25 E. Grand st., Springfield, O.
- Siegfried, Howard J.,  
4676 Frankford ave., Philadelphia, Pa.
- Sieker, Ferdinand A.,  
395 Clinton ave., W. Hoboken, N. J.
- Sievcare, Fred Geo.,  
Station P, Tacoma, Wash.
- Sievers, Arthur,  
Bu. of Plant Ind., Washington, D. C.
- Simmel, Martin,  
S. 1st C. H. C., U. S. A., c. Depot  
Q. M. Corps, 26th St. & Gray's  
Ferry Road, Philadelphia, Pa.
- Simmons, Fred. S.,  
Ft. Washington, Md.
- Simmons, Haydn Mozart,  
757 Chelan Bldg., San Francisco,  
Calif.
- Simmons, Joseph A.,  
10 Hubert st., Du Bois, Pa.
- Simon, Wm.,  
Edmondson ave., Cantonsville, Md.
- Simpson, Robert,  
201 N 36th st., Philadelphia, Pa.
- Simpson, William Monroe,  
2509 Beale ave., Altoona, Pa.
- Sinclair, Edw. A., Ph.C.,  
Main st., Troy, Kans.
- Sizemore, Clarence R.,  
3874 Page blvd., St. Louis, Mo.
- Skinner, Charles H.,  
Main & State sts., Windsor, Vt.
- Slade, Henry A.,  
10 State st., Montpelier, Vt.
- Slauson, John G.,  
160 Genesee st., Utica, N. Y.
- Sloan, Earl Douglas,  
4 Granada Apts., Nashville, Tenn.
- Sloss, Robert A.,  
Phar. Clinton Prison, Dannemora,  
N. Y.
- Slover, James A.,  
110 6th st., Grants Pass, Ore.
- Smetana, William S.,  
916 Excelsior ave., Hopkins, Minn.
- Smith, B. Frank,  
1601 Market st., Harrisburg, Pa.
- Smith, Carl E.,  
5 Beekman st., New York, N. Y.
- Smith, Frank L.,  
214-216 2d ave., N., Nashville,  
Tenn.

- Smith, Fred. A. U., Ph.C.,  
2002 Iglehart st., St. Paul, Minn.
- Smith, George H.,  
Box 595, Fresno, Cal.
- Smith, George Waterman,  
Honolulu, Territory Hawaii.
- Smith, Guy L.,  
Front st., Douglas, Alaska.
- Smith, Howard F.,  
2d & Green sts., Philadelphia, Pa.
- Smith, Howard H., Ph.G., M.D.,  
845 Boylston st., Boston, Mass.
- Smith, Isaac Clifton,  
Ocilla, Ga.
- Smith, J. Hungerford,  
410 N. Goodman st., Rochester,  
N. Y.
- Smith, Lauriston Stephen, Ph.G.,  
Ocean ave., cor. Pacific, Long Beach,  
Cal.
- Smith, Linville, H.,  
701 Center st., Jamaica Plain, Mass.
- SMITH, OTIS W.,  
5th & Engineers sts., Sedalia, Mo.
- Smith, Paul W.,  
4836 Delmar Blvd., St. Louis, Mo.
- Smith, Theo.,  
1343 Pennsylvania ave., Baltimore,  
Md.
- Smith, Walter, V.,  
2d & Green sts., Philadelphia, Pa.
- Smith, Wm. H.,  
Desmond ave., Bronxville, N. Y.
- Snider, Hilton F.,  
195 Exchange st., Rochester, N. Y.
- Sniteman, Chas. C.,  
Neillsville, Clark Co., Wis.
- Snodgrass, Latta K.,  
120 Main st., Little Rock, Ark.
- SNOW, CHAS. W.,  
214 Warren st., Syracuse, N. Y.
- Snow, Clyde M., Ph.G., M.A.,  
74 E. 12th st., Chicago, Ill.
- Snow, Herbert W., Ph.C.,  
220 N. Franklin st., Chicago, Ill.
- Snyder, Alfred Harrington,  
51 Prospect st., Bridgeport, Conn.
- Snyder, Ambrose C.,*  
282 St. James Place, Brooklyn, N. Y.
- Snyder, Forrest Omo,  
423 W. 60th st., Chicago, Ill.
- Snyder, Wm. E., Ph.G.,  
6140 Michigan ave., Chicago, Ill.
- Sohrbeck, Geo. H.,  
5th ave. & 16th st., Moline, Ill.
- Sohrbeck, Geo. Wm., Ph.G.,  
1804 6th ave., Moline, Ill.
- Sollmann, Torald,  
1353 E. 9th st., Cleveland, O.
- Solomons, Isaiah A.,  
29 Congress st., W., Savannah, Ga.
- Solomons, Isaiah, Jr.,  
c. Solomons Co., Savannah, Ga.
- Sommer, Richard E. W.,  
1302 Wells st., Milwaukee, Wis.
- Soper, Geo. M.,  
619 4th st., Sioux City, Ia.
- Sords, Thos. V.,  
1410 W. 25th st., Cleveland, O.
- Southard, Frank A., Ph.G., Pub. H. S.,  
3d & Kilgour st., Marine Hospital  
Bldg., Cincinnati, O.
- Spalding, Clarence G.,  
89 Church st., New Haven, Conn.
- Spargur, Roy Miles,  
Twin Falls, Idaho.
- Sparks, Edgar R., Ph.G.,  
239 High st., Burlington, N. J.
- Sparks, James M.,  
917 Garrison ave., Ft. Smith, Ark.
- Spease, Edw., B.Sc., Ph.C.,  
89 E. Norwich ave., Columbus, O.
- Speckart, Otto Norbert,  
3342 Franklin ave., St. Louis, Mo.
- Speer, Chas. C.,  
St. Augustine, Fla.
- Speer, William O.,  
458 Greenwich st., Valparaiso, Ind.
- Spiegel, Adolph,  
101 Grand ave., Milwaukee, Wis.
- Spire, Wm. B., Phar.D.,  
1335 N. Car. ave., N. E., Washing-  
ton, D. C.
- Sporndli, Ernest,  
917 B st., Haywards, Cal.
- Sprague, Wesson G.,  
Main st., Flushing, Mich.
- Spring, Geo. A.,  
664 6th ave., New York, N. Y.
- Spry, Ezekiel,  
c. Chief Surgeon, Philippine Dept.,  
Manila, P. I.



- Staack, Hugo F.,  
     Maquoketa, Iowa.  
 Stacey, John Edward, Ph.G.,  
     Summer st., East Saugus, Mass.  
 Stacy, Marion F.,  
     14 W. Sale st., Tuscola, Ill.  
 Stadelmann, Harry E.,  
     7042 Stony Island ave., Chicago, Ill.  
 Staehli, Theo. H.,  
     1212 Columbus ave., Boston, Mass.  
 Stahlhuth, Ernest H. W., Ph.G.,  
     423 Washington st., Columbus, Ind.  
 Stallings, Robert Emmett,  
     130 State Capitol, Atlanta, Ga.  
 Stam, Donald F.,  
     Easton, Md.  
 Stamm, Dante McL.,  
     Geneseo, Ill.  
 St. Amour, Omer,  
     Box 1819, Ste. Agathe, Des Monts,  
     Quebec.  
 Stange, Carl Frederick, Ph.G.,  
     1400 18th st., San Francisco, Cal.  
 Stanislaus, Ignatius, Valerius Stanley,  
     1214 Arch st., Philadelphia, Pa.  
 Start, Ray C.,  
     2555 Cherry St., Toledo, O.  
 Starwalt, Ellis Jayson,  
     1371 12th st., Detroit, Mich.  
 Staudt, Albert J.,  
     3520 Spring Garden st., Philadel-  
     phia, Pa.  
 Staudt, Louis C.,  
     15 S. Broadway, Aurora, Ill.  
 Stearns, Wm. L., Ph.G.,  
     Pharm. U. S. Pub. Health Service,  
     Stapleton, N. Y.  
 Steele, Irving Edward,  
     Sgt. H. C. U. S. A., A. Pettit Bar-  
     racks, Zamboanga, Mindanao,  
     P. I.  
 Stephan, Otto P., Ph.G.,  
     132 E. 22d st., Chicago, Ill.  
 Stephenson, John J., Ph.G.,  
     2140 Jamaica ave., Richmond Hill,  
     L. I., N. Y.  
 Sterling, Chas. M., A.B.,  
     920 Indiana, Lawrence, Kans.  
 STEVENS, ALVISO B.,  
     Chem. Laboratory, Ann Arbor,  
     Mich.  
 Stevens, Fred S.,  
     Auburn, Cal.  
 Stevens, Grant W.,  
     339 Woodward ave., Detroit, Mich.  
 Stevenson, Arthur E.,  
     1312 Mass. st., Lawrence, Kans.  
 Stevenson, Wm. P.,  
     210 Spruce ave., Rochester, N. Y.  
 Stewart, Alex.,  
     65 Wyndham st., Guelph, Ontario,  
     Can.  
 Stewart, Francis E., Ph.G., M.D.,  
     11 W. Phil-Elena st., Philadel-  
     phia, Pa.  
 Stewart, Harry E.,  
     Box 218, Jacksonville, Fla.  
 Stewart, J. A.,  
     720 Jefferson ave., E., Detroit, Mich.  
 Stiefel, Albert F.,  
     44th & Butler sts., Pittsburgh, Pa.  
 Stier, Carl, Ph.G.,  
     Phar. Pub. H. Ser., Gulf Quarantine  
     Sta., Biloxi, Miss.  
 Stingel, Jacob L.,  
     Twinsburg, O.  
 Stinson, Hugh,  
     4th & Douglas sts., Des Moines, Ia.  
 Stockberger, Dr. Warner W.,  
     Bureau of Plant Industry, Wash-  
     ington, D. C.  
 Stocking, Charles Howard,  
     540 Chautauqua ave., Norman, Okla.  
 Stoddart, Thos.,  
     84 Seneca st., Buffalo, N. Y.  
 Stofer, Richard Calvin,  
     28 Hayes st., Norwich, N. Y.  
 Stolle, Henry J.,  
     4235 Magnolia ave., St. Louis, Mo.  
 Stotz, David,  
     205 E. Genesee st., Syracuse, N. Y.  
 Stone, Clarence G., Ph.C.,  
     273 Rich ave., Mt. Vernon, N. Y.  
 Stookey, H. Frank,  
     116 N. Franklin, Kirksville, Mo.  
 Storer, Chas. A.,  
     Rush & Ohio sts., Chicago, Ill.  
 Stoughton, Mary A. (Mrs.),  
     752 Park st., Hartford, Conn.  
 Stout, Marion A., Ph.G.,  
     128 W. Wabash, Bluffton, Ind.

- Stover, Chas. A., Ph.G.,  
 1360 Mass. ave., Cambridge, Mass.  
 Stover, Wm. Francis,  
 480 Shirley st., Winthrop, Mass.  
 Stowe, James Pinkney,  
 26 So. Tryon st., Charlotte, N. C.  
 Strahlmann, Edw.,  
 4th & D sts., San Diego, Cal.  
 Strassenburgh, John Harold,  
 195 Exchange St., Rochester, N. Y.  
 Strauss, David,  
 Springfield ave. & High st., Newark,  
 N. J.  
 Strawn, May (Miss), Ph.C.,  
 365 St. Aubin ave., Detroit, Mich.  
 Streep, Frank P.,  
 Chestnut Hill, Philadelphia, Pa.  
 Strickland, Bert W.,  
 1500 Broadway, Denver, Colo.  
 Strickland, Franklin N.,  
 4 Market Sq., Providence, R. I.  
 Stroh, George D.,  
 Pittston, Pa.  
 Stroup, Freeman P., Ph.M.,  
 145 N. 10th st., Philadelphia, Pa.  
 Stuart, Francis J.,  
 3964 Wyoming st., St. Louis, Mo.  
 Stuart, H. A. (Mrs.),  
 3321 3d ave., S., Minneapolis, Minn.  
 Stuchlik, John,  
 3859 W. 26th st., Chicago, Ill.  
 Stucky, Edw. W., Ph.B., A.M.,  
 161 N. Illinois st., Indianapolis, Ind.  
 Sturgeon, Walter J.,  
 305 Market st., Kittanning, Pa.  
 Sturmer, Julius Wm., Ph.G., Phar.D.,  
 1715 Cherry st., Philadelphia, Pa.  
 Stutzlen, Frank C.,  
 10 Park ave., Elizabeth, N. J.  
 Stutzlen, Harry A.,  
 387 Springfield ave., Newark, N. J.  
 Sullivan, John P.,  
 401 N. Carey st., Baltimore, Md.  
 Sultan, Fred. Wm.,  
 6151 Kingsbury Blvd., St. Louis, Mo.  
 Summers, Franklin P.,  
 1751 Ainslee st., Chicago, Ill.  
 Summers, Robert C.,  
 Columbus, Ky.  
 Sumner, Jennie H. (Miss), Ph.G.,  
 1858 Centre st., W. Roxbury, Mass.  
 Suppan, Leo R. A.,  
 2112 Oregon ave., St. Louis, Mo.  
 Suter, Arthur Lee,  
 1295 Bardstown Rd., Louisville, Ky.  
 Sutherland, Geo. McK.,  
 1344 Sherman st., Alameda, Cal.  
 Swain, Robert L.,  
 Sykesville, Md.  
 Swaringen, Dewitt C.,  
 China Grove, N. C.  
 Swartz, Geo. F.,  
 Redfield, S. D.  
 Sweeney, A. J.,  
 Salem, Ill.  
 Sweet, Caldwell,  
 26 Main st., Bangor, Me.  
 Sweet, Wm. H.,  
 1731 Chicago ave., Minneapolis,  
 Minn.  
 Swoboda, Adolph,  
 901-903 14th st., Denver, Colo.  
 Tabenski, Longin, Ph.G., M.D.,  
 1725 W. 18th st., Chicago, Ill.  
 Taber, Joseph M.,  
 c. Elko Co. Hosp., Elko, Nev.  
 Takamine, Jokichi,  
 550 W. 173d st., New York, N. Y.  
 Talbott, W. A.,  
 Warren, Pa.  
 Tam, Merrit W.,  
 Warren, Ind.  
 Tamayo, Jose A.,  
 15 Canerio st., Manzanillo, Cuba.  
 Tanney, Lewis,  
 Sergt. 1st Cl. H. C., U. S. A., Ft.  
 Wm. McKinley, Rizal, P. I.  
 Tansey, Owen Hilary,  
 1106 Green ave., Westmount,  
 Province of Quebec, Canada.  
 Tapley, Francis Herbert,  
 21 Massachusetts ave., Boston, Mass.  
 Taquechel, Francisco,  
 Box 103, Obispo 27, Havana, Cuba.  
 Tarkenton, Edw. L.,  
 Nash st., Wilson, N. C.  
 Taylor, Edgar D.,  
 1305 Main st., Richmond, Va.

- Taylor, Francis O., Ph.C.,  
 53 W. Alexandrine ave., Detroit,  
 Mich.  
 Taylor, Henry L., A.B., A.M., Ph.D.,  
 Education Bldg., Albany, N. Y.  
 Taylor, James H.,  
 1518 Carondelet st., New Orleans,  
 La.  
 Taylor, Milton M.,  
 602 Franklin st., Tampa, Fla.  
 Taylor, Thomas R.,  
 Park & Brambleton aves., Nor-  
 folk, Va.  
 Taylor, Wm.,  
 151 W. 140th st., New York, N. Y.  
 Teeters, Wilber J.,  
 Iowa Coll. of Pharm., Iowa City, Ia.  
 Thiesing, Edw. H.,  
 Gilbert & Lincoln aves., Cincin-  
 nati, O.  
 Thomas, Clyde L.,  
 Grandville, Mich.  
 Thomas, John B.,  
 Balto. & Light sts., Baltimore, Md.  
 Thomas, Robert, Jr.,  
 108 S. Broad st., Thomasville, Ga.  
 Thomas, Wm. H., Sgt. H. C. U. S. A.,  
 Regan Barracks, Albay, P. I.  
 Thomason, Wm. P.,  
 Guntersville, Ala.  
 Thome, Edgar R., Ph.D.,  
 238 N. Webster st., Jackson, Mich.  
 Thompson, Albert D.,  
 1st ave. S & 3rd sts., Minneapolis,  
 Minn.  
 Thompson, Edwin T.,  
 911 W. 7th st., Sioux City, Ia.  
 Thompson, Frank A., Ph.C.,  
 502 Trombley ave., Detroit, Mich.  
 Thompson, John R.,  
 641 Summerlea st., Pittsburgh, Pa.  
 Thompson, Leon A., Pharm.D.,  
 809 Beacon st., Boston, Mass.  
 Thompson, Robert Lee,  
 1718 Broad st., Nashville, Tenn.  
 Thorburn, Albert D.,  
 316 E. 33d st., Indianapolis, Ind.  
 THORN, HENRY P., Ph.G.,  
 5 S. Main st., Medford, N. J.  
 Thornhill, Sewell,  
 Sayville, N. Y.  
 Thum, George Ernest,  
 261 3d st., Elizabeth, N. J.  
 Thum, John K., Ph.G.,  
 Ger. H., Corin & Girard aves.,  
 Philadelphia, Pa.  
 Thumser, Louis Frank,  
 232 Monticello ave., Jersey City,  
 N. J.  
 THURSTON, AZOR,  
 Grand Rapids, Wood Co., O.  
 Tierney, James A.,  
 Glenville, W. Va.  
 Tillotson, Ward C.,  
 601 16th st., Denver, Colo.  
 Tilton, Claude E.,  
 Fairmount, Ill.  
 Timmermann, Richard H.,  
 802 Lexington ave., New York, N. Y.  
 Timmons, Geo. D., Ph.G., B.S., Ph.C.,  
 458 Greenwich st., Valparaiso, Ind.  
 Tobey, Chas. W., Ph.G.,  
 3 Market st., Troy, O.  
 Tobin, John J.,  
 243 Dorchester st., S., Boston, Mass.  
 Tocco, Orazio,  
 81-83 Chrystie st., Brooklyn, N. Y.  
 Todd, Abel Robert,  
 Drug Analyst, Dairy & Food Dept.,  
 Lansing, Mich.  
 Todd, Albert May,  
 204 N. Rose St., Kalamazoo, Mich.  
 Todd, Joseph A.,  
 501 4th st., Sioux City, Ia.  
 Topping, Arthur E., Ph.G.,  
 Overbrook, Kans.  
 Topping, Geo. B., Ph.C.,  
 61 Parsons ave., Columbus, O.  
 Toulson, Milbourne A., Ph.G.,  
 Chestertown, Md.  
 Tousfeldt, J. P.,  
 White Salmon, Wash.  
 Trainer, Frank,  
 Regimental Hosp., 22nd Infantry,  
 Texas City, Texas.  
 Trantham, Isham A.,  
 876 N. Main St., Springfield, Mo.  
 Tremble, John Edward,  
 644 St. Catherine st. West, Mon-  
 treal, Quebec, Canada.  
 Trienens, Joseph,  
 819 Buena ave., Chicago, Ill.

- Trolinger, Ernest Franklin,  
1410 Forrest ave., Nashville, Tenn.
- Troupin, Eli Salmon,  
349 Harrison ave., Boston, Mass.
- Tripp, Arthur H.,  
573 Talbot ave., Dorchester Center,  
Mass.
- Truby, Grace (Miss),  
Presbyterian Hosp., Pittsburgh, Pa.
- Truedson, Eric P.,  
Puyallup, Wash.
- Trumpold, Emil Herman,  
1108 Adams St., Dorchester, Mass.
- Tucker, Thoms H.,  
28-30 Fulton st., New York, N. Y.
- Tupper, Edward A.,  
800 10th St., S., Minneapolis, Minn.
- Turnbull, Walter J.,  
1173 Hamilton Blvd., Detroit, Mich.
- Turner, Joseph L.,  
c. Briston-Myers Co., 281 Greene  
ave., Brooklyn, N. Y.
- Tuthill, Fred. P., Ph.G., Phar.D.,  
1457 Union st., Brooklyn, N. Y.
- Tuttle, Geo. O.,  
387 Congress st., Portland, Me.
- Tyson, L. Raymond,  
Midvale, Idaho.
- Uhlich, Ferdinand G.,  
2001 Salisburg st., St. Louis, Mo.
- Ulm, Hamilton C.,  
224 Jackson st., Toledo, Ohio.
- Ulrich, Richard J.,  
402 Cedar ave., Niagara Falls, N. Y.
- Umenhofer, Adolph,  
2405 N. Halsted st., Chicago, Ill.
- Urban, Leopold C.,  
531 Market st., Milwaukee, Wis.
- Utech, P. Henry, Ph.G.,  
209 Chestnut st., Meadville, Pa.
- Utterback, Earl,  
532 S. Van Buren st., Iowa City, Ia.
- VanAller, Thos. S.,  
210 S. Broad st., Mobile, Ala.
- Van Antwerp, James C.,  
250 State st., Mobile, Ala.
- Van Derveer, Robert H.,  
Broad & Monmouth sts., Red  
Bank, N. J.
- Van Dyke, Chas.,  
253 56th st., Salt Lake City, Utah.
- Van Liew, Wm. K.,  
Akron, Colo.
- Van Ness, Geo. I.,  
McLean, Ill.
- Van Schaack, Cornelius, P.,  
114 W. Lake st., Chicago, Ill.
- Van Vleet, M.,  
506 Gratiot Ave., Detroit, Mich.
- Vance, Winfield S.,  
5th & Broad sts., Gadsden, Ala.
- Vanderkleed, Chas. E.,  
200 Harvard ave., Collingswood,  
N. J.
- Vane, Patrick P.,  
309 B st., S. E., Washington, D. C.
- Varga, John,  
2017 W. 25th st., Cleveland, Ohio.
- Vargas, Jorge,  
1120 Boylston st., Boston, Mass.
- Varney, Edw. F.,  
1301 Broadway, Oakland, Cal.
- Varnum, Walter H.,  
801 Massachusetts st., Lawrence,  
Kans.
- Vaupell, Geo. F.,  
758 S. Western ave., Chicago, Ill.
- Vazquez, Carlos R., M.D.,  
13 Calixto Garcia, P. O. Box 49,  
Manzanillo, Cuba.
- Veillon, Louis, M.D.,  
1800 S. Second st., Monsanto Chem-  
ical Works, St. Louis, Mo.
- Vellema, Peter,  
5 Leonard st., N.W., Grand Rapids,  
Mich.
- Velsor, Joseph A.,  
9 Gold st., New York, N. Y.
- Vennemann, P. Heinrich,  
S. 1st C. H. C., U. S. A., 1023 White  
Bear ave., St. Paul, Minn.
- Vernor, James,  
33 Woodward ave., Detroit, Mich.
- Viehover, Arno, M.D.,  
Bur. of Chem., Dept. of Agricul-  
ture, Washington, D. C.
- Vitous, Walter J.,  
Doty, Wash.
- Voigt, Joseph F.,  
840 Market st., Chattanooga, Tenn.
- VOISS, ARCADIS,  
1200 Wells st., Chicago, Ill.



- Von Koss, Joseph J.,  
32 Adams ave., W. Detroit, Mich.
- VORDICK, AUGUST H.,  
6351 Berlin ave., St. Louis, Mo.
- Vorisek, Anton,  
115 W. 68th st., New York, N. Y.
- Vorsanger, Lillian,  
2354 Milwaukee ave., Chicago, Ill.
- Voss, Edw., Jr.,  
1201 Vine st., Cincinnati, O.
- Votteler, Wm.,  
Shelby & Oak sts., Louisville, Ky.
- Vowell, Louis S.,  
62 S. Main st., Washington, Pa.
- Wadder, Arlie L.,  
2101 8th ave., Nashville, Tenn.
- Wafer, John Gill,  
Pres. La. State Pharm. Ass'n,  
Homer, La.
- Wagner, Arthur C.,  
11 Pierce ave., Everett, Mass.
- Wagner, Jacob L.,  
205 West 11th ave., Columbus, Ohio.
- Wagner, Louis,  
Mountain View, Cal.
- Wait, C. Raymond,  
242 Grand River ave., Detroit, Mich.
- Waitz, August Henry,  
Sergt. H. C., U. S. A., Transport  
Wright, Zamboanga, Mindanao,  
P. I.
- WALBRACH, ARTHUR,  
1200 15th st., Denver, Colo.
- Walbridge, Cyrus P.,  
N. E. cor. 4th & Markets sts., St.  
Louis, Mo.
- Waldrop, R. W.,  
Lynnville, Tenn.
- Waldrum, Jonas Y.,  
1109 Halcyon ave., Nashville, Tenn.
- Walker, Alfred,  
Sutton, W. Va.
- Walker, Fred. D. G.,  
4th ave. & 20th St., Rock Island, Ill.
- Walker, Joseph P.,  
Charity Hosp., New Orleans, La.
- Walker, Robert H., B.S., Ph.M.,  
Gonzales, Tex.
- Wall, Otto A.,  
4108 W. Pine st., St. Louis, Mo.
- Wallace, George R.,  
426 Fairmount ave., Philadelphia, Pa.
- Wallace, John C., Phar.D.,  
113 E. Washington st., New Cas-  
tle, Pa.
- Walleck, Andrew E.,  
8341 Woodland ave., Cleveland,  
Ohio.
- Waller, Olva L.,  
5610 N. Market st., St. Louis, Mo.
- Walsdorf, Edw. H.,  
900 Peters ave., New Orleans, La.
- Walsh, John Francis,  
12 Ft. Sq., Greenfield, Mass.
- Walter, Peter G., Ph.G., Pharm.D.,  
Chestnut & Lockhart sts., Pitts-  
burgh, Pa.
- Walton, Lucius L., Ph.G., Ph.M.,  
Ph.D.,  
N. E. cor. 4th & Pine sts., Williams-  
port, Pa.
- Waltz, George Harry,  
1831 Mosher st., Baltimore, Md.
- Walz, Jacob L.,  
2128 Mt. Holly st., Walbrook,  
Baltimore, Md.
- Ward, Francis W.,  
15 S. Main st., Memphis, Tenn.
- Wardin, Ralph L., Ph.G.,  
Nevada, Mo.
- Wardle, Arthur S.,  
1-3 Warren st., Hudson, N. Y.
- Ware, Chas. H.,  
1930 Madison ave., Baltimore, Md.
- Warn, Wm. E.,  
50 First st., Keyport, N. J.
- Warner, William James,  
1671 Shattuck ave., Berkeley, Cal.
- Warren, Lewis E.,  
4525 N. Robey st., Chicago, Ill.
- Warren, Robert Arthur,  
Clarksville, Ark.
- Washburn, Homer C., Ph.C., B.S.,  
864 14th st., Boulder, Colo.
- Washburn, Madison W.,  
457 Washington st., Buffalo, N. Y.
- Waterhouse, Joseph T.,  
1 Lincoln ave., Newton Hlds., Mass.
- Waters, Morris Wilson,  
1344 Wisconsin ave., N. W., Wash-  
ington, D. C.

- Watkins, Chas. Wm.,  
227 S. Illinois st., Indianapolis, Ind.
- Watson, Elmer A.,  
Clayton, Ill.
- Watson, George N.,  
1001 Maine st., Lawrence, Kans.
- WATSON, HERBERT K.,  
803 Market st., Wilmington, Del.
- Watson, Joseph R., Ph.C.,  
330 18th ave., N., Seattle, Wash.
- Watson, Wm., Jr.,  
45 Howard ave., Utica, N. Y.
- Watters, Alex. J.,  
266 E. 5th st., Los Angeles, Cal.
- Watters, Henry,  
138 Rideau st., Ottawa, Can.
- WAUGH, GEO. J.,  
Ontario st., Stratford, Ontario, Can.
- Weaver, Clarence A.,  
941 Trumbull ave., Detroit, Mich.
- Webb, Alvin Chester,  
6630 Germantown ave., Philadelphia, Pa.
- Webb, Edw., N.,  
277 E. 14th st., Columbus, O.
- Webb, Evans H.,  
Residence unknown.
- Webb, John W.,  
Main st., Stuttgart, Ark.
- Weber, Don C.,  
Arlington, Neb.
- Webster, Duane Earle,  
North st., Grafton, Mass.
- Webster, John H., Ph.G.,  
933 East Lafayette st., Detroit, Mich.
- Webster, Richard C.,  
26 N. Main st., Canton, Ill.
- Weeks, Carl,  
Des Moines, Ia.
- Weicker, Theo.,  
Prospect Manor, Stanford, Conn.
- WEIDEMANN, CHAS. A., Ph.G., M.D.,  
2148 Green st., Philadelphia, Pa.
- Weik, John,  
Edward & Madison rd., Cincinnati, O.
- Weil, Jacob,  
255 Canal st., New York, N. Y.
- Weinkauff, Jacob,  
600 Fifth ave., Peoria, Ill.
- Weinstein, Joseph,  
1771 Madison ave., New York, N. Y.
- Weir, Samuel A.,  
Sgt. H. C., U. S. A., Ft. Robinson, Neb.
- Weise, Carl E.,  
2705 West End ave., Nashville, Tenn.
- Weiser, Wm. P.,  
501 Market st., Camden, N. J.
- Weisner, Nicholas F.,  
2349 Germ'n ave., Philadelphia, Pa.
- Weiss, Conrad H.,  
1907 Nicholas ave., Anacostia, D. C.
- Weiss, Emil O.,  
794 6th ave., New York, N. Y.
- Weiss, Wm. J.,  
424 Baxter ave., Louisville, Ky.
- Weissmann, Charles,  
2332 Highland ave., Cincinnati, O.
- Welch, Sister Mary Bernard,  
Hotel Dieu, 2004 Tulane ave., New Orleans, La.
- WELLCOME, HENRY S.,  
Snow Hill Bldg., London, England.
- Weller, Franklin P.,  
755 8th st., S. E., Washington, D. C.
- Wells, James H., LL.B.,  
Fifth ave. & Jackson st., Chicago, Ill.
- Welsh, Joseph B.,  
c. Lax Fos Co., Paducah, Ky.
- Wendt, Wm. C.,  
47 S. High st., Columbus, O.
- Wentland, William Henry,  
Manor, Texas.
- Werckshagen, Otto,  
258 W. Biddle st., Baltimore, Md.
- Werner, John,  
Suite 7, Sherbrooke Block, Winnipeg, Canada.
- Werner, Louis,  
914 Race st., Cincinnati, O.
- Werner, Wm. F.,  
2202 E. 10th st., Indianapolis, Ind.
- Wernert, Joseph A.,  
405 Michigan st., Toledo, Ohio.
- Wesner, Henry C.,  
Box 22, Windsor, Mo.
- West, Chas. A.,  
14 Fulton st., Boston, Mass.
- Westbrook, Chas. G.,  
Lock Box 134, Newbern, Tenn.

- Westcott, James W., Ph.G.,  
Charles & Franklin sts., Baltimore,  
Md.
- Westheimer, David,  
322 Central ave., Brooklyn, N. Y.
- Westmoreland, Edwin R., Ph.G.,  
Lockhart, Tex.
- Westpfahl, Ernest W.,  
Delmar Jct., Iowa.
- Wetterstroem, Caroline (Mrs.),  
2844 Colerain ave., Cincinnati, O.
- Wetterstroem, Theo. D., Ph.G.,  
3935 Spring Grove ave., Cincinnati, O.
- Wheatcroft, John C.,  
Grayville, Ill.
- Wheeler, Albert A., Pharm.D.,  
1050 Lawton ave., Detroit, Mich.
- Wheeler, Carlton B.,  
18 Main st., Hudson, Mass.
- Wheeler, John B.,  
Huron, S. D.
- Whelan, Wm. F.,  
6th Floor, 237 Washington st., Buf-  
falo, N. Y.
- WHELPLEY, HENRY M., PhG., M.D.,  
2342 Albion Place, St. Louis, Mo.
- Whisenant, Walter Hines,  
117 E. Houston st., San Antonio,  
Texas.
- White, Edw. R.,  
Main st., Salisbury, Md.
- White, Jennie Maguire,  
416 Hayes st., San Francisco, Cal.
- White, Joseph L.,  
130 1st st., N. W., Washington,  
D. C.
- White, Robert W., Ph.G.,  
5601 Lansdowne ave., Philadel-  
phia, Pa.
- White, Wm. R., Ph.C.,  
311 Grace st., Nashville, Tenn.
- Whitehead, Bower T.,  
Brookings, S. D.
- Whitmore, Geo. C.,  
601 Harrison ave., Leadville, Colo.
- Whitney, David V., Ph.G.,  
714 Wyandotte st., Kansas City, Mo.
- Whitney, Minne M. (Mrs.),  
714 Wyandotte st., Kansas City, Mo.
- Whittington, Omar Harwell,  
Van Buren, Arkansas.
- Whittle, Wm. A.,  
802 Gorsuch ave., Baltimore, Md.,
- Whittlesey, Henry H.,  
East Side Pharmacist, Pocatello,  
Idaho.
- Whitworth, Charles Bell,  
1134 Jefferson st., Nashville, Tenn.
- Whitworth, Frank E.,  
775 S 2d st., Salt Lake City, Utah.
- Whorton, Carl,  
5th & Chestnut sts., Gadsden, Ala.
- Wich, Henry E.,  
1230 N. Stricker st., Baltimore, Md.
- Wicker, Judson A.,  
20 Brookdale st., Roslindale, Mass.
- Wickett, Francis Wm., S. H. C.,  
U. S. A., Post Hosp., Jefferson Bar-  
racks, Mo.
- WICKHAM, WM. H.,  
91 Fulton st., New York, N. Y.
- Widsig, T. J.,  
6th & Washington ave., Newport,  
Ky.
- Wiedemann, Hugo Edmund,  
Chemical Bldg., St. Louis, Mo.
- Wiggin, Harry C.,  
14 Fulton st., Boston, Mass.
- WILBERT, MARTIN I.,  
1621 35th st., N. W., Washington,  
D. C.
- Wilcox, Levi, Ph.B.,  
145 Woodlawn Ter., Waterbury,  
Conn.
- Wiles, Wood,  
104 W. Walnut st., Bloomington,  
Ind.
- Wiley, Anna L. (Mrs.),  
Hartville, Ohio
- Wiley, Harvey W.,  
Cosmos Club, Washington, D. C.
- Wilfrid, Sister Mary,  
Mt. Carmel Hospital, W. State st.,  
Columbus, Ohio.
- Wilkerson, Jerome A.,  
2036 Russell st., St. Louis, Mo.
- Will, Albert R.,  
398 E. Northwood, Columbus, Ohio.
- Willette, Sidney Burke,  
4201 N 11th st., St. Louis, Mo.
- Williams, Arthur R.,  
Sturgis, S. D.

- Williams, Edward,  
4401 Harrison st., Chicago, Ill.
- Williams, Edward,  
1 W. Main st., Madison, Wis.
- Williams, Geo. G.,  
99 North st., Boston, Mass.
- Williams, John L.,  
Doctor of Optics, P. O. Box 308,  
Three Rivers, Province Quebec.
- Williams, Lawrence S.,  
c. Morgan & Millard,  
1300 N. Caroline St., Baltimore, Md.
- Williams, N. Emery, Ph.G.,  
508 N. Grand ave., St. Louis, Mo.
- Williams, Sam. A.,  
Elm st., Troy, Ala.
- WILLIAMS, SEWARD W., Ph.C., F.C.S.,  
5415 East End ave., Chicago, Ill.
- Williamson, J. Otis,  
Box 87, Montgomery, Ala.
- Willman, Wm. G.,  
Adams st., Brownsville, Tex.
- Willson, Geo. A.,  
106 Branch st., Lowell, Mass.
- WILSON, BENJ. O.,  
19 Morse st., Newton, Mass.
- Wilson, Chas. F.,  
6857 So. State st., Chicago, Ill.
- Wilson, Lincoln,  
3973 Tennyson St., Denver, Colo.
- Wilson, Lucius, Lamar,  
Tucumcari, N. M.
- Wilson, Robert C.,  
University of Georgia, Athens, Ga.
- Wimmer, Curt Paul,  
115 W. 68th st., New York, N. Y.
- Windolph, J. Fred.,  
Hayes st., Norwich, N. Y.
- WINKELMANN, JOHN H.,  
118 W. Lombard st., Baltimore, Md.
- Winslow, Edw. F.,  
Bryn Mawr, Pa.
- Winter, Carl,  
2812 E. 79th st., Cleveland, O.
- Winter, James H.,  
1375 Valencia st., San Francisco, Cal.
- Winterbottom, James Albert,  
Pharmacist, U. S. N., Las Animas,  
Colo. Naval Hospital.
- Wirth, Adam, Ph.M.,  
5902 Hurst, cr. Elenore st., New  
Orleans, La.
- Wirthman, John G.,  
1335 Grand ave., Kansas City, Mo.
- Wirthmann, Joseph C.,  
31st & Frost ave., Kansas City, Mo.
- Wisner, Ebert H.,  
508 Washington st., N., Valparaiso,  
Ind.
- Wittkamp, Clarence T.,  
Montgomery & Brewster ave.,  
Cincinnati, Ohio.
- Witting, Fred, F., Ph.G.,  
Longmont, Colo.
- Wittmer, Robt. S. R.,  
23 Broadway, Pittsburgh, Pa.
- Woehner, Fred. A.,  
Drawer 1730, Great Falls, Mont.
- Wolf, Chas. A.,  
401 S. Broadway, Baltimore, Md.
- Wolf, James C.,  
2207 E. Pratt st., Baltimore, Md.
- Wolf, Michael F.,  
Eastern ave. & Chester st., Balti-  
more, Md.
- Wolff, Daniel O.,  
5th & Washington sts., Hunting-  
don, Pa.
- Wolff, Edw. H.,  
522 Washington ave., St. Louis, Mo.
- Wolff, Frederick W.,  
6th & Washington aves., St. Louis,  
Mo.
- Wood, Frank Davidson,  
202 Front st., Morgantown, W. Va.
- Wood, Horatio C., Jr., M.D.,  
434 S. 44th st., Philadelphia, Pa.
- Wood, Jas. Herbert,  
20 Broad st., Bloomfield, N. J.
- Wood, James P.,  
2 Church st., New Haven, Conn.
- Woodbury, Frank A.,  
No. 1 Lewis st., East Boston, Mass.
- Woods, Samuel R.,  
110 S. Main st., Lamar, Colo.
- Woodworth, D. Olin,  
122 W. 1st st., Albany, Ore.
- Woolley, Stephan Disbrow,  
43 Main ave., Ocean Grove, N. J.



- Woolsey, Jesse F.,  
 11 Cliff st., New York, N. Y.  
 Wooten, Thos. V., Ph.G.,  
 43-93 Leon st., Boston, Mass.  
 Wooten, Yandell Paul,  
 Lebanon, Tenn.  
 Wooyenaka, Keizo,  
 564 W. 173d st., New York, N. Y.  
 Worth, Thos. R.,  
 109 N. Main st., Sebastopol, Cal.  
 Worthington, John W. W.,  
 State Hosp., Norristown, Pa.  
 Wrench, Henry E., Jr., Ph.G.,  
 610 Bloomfield ave., Montclair,  
 N. J.  
 Wulling, Fred. J.,  
 Minnesota Univ., Minneapolis, Minn.  
 Wunderlich, Edw.,  
 1532 Dryades st., New Orleans, La.  
 Wurdach, John H.,  
 51 Grape st., Knoxville, Pitts-  
 burgh, Pa.  
 Wyckoff, Elmer E.,  
 246 E. 5th st., Brooklyn, N. Y.  
 Yaffa, David Benjamin,  
 101 Prospect Park, W., Brooklyn,  
 N. Y.  
 Yates, Edw. T.,  
 809 South 16th st., Omaha, Neb.  
 Yeargan, Reagan Lawrence,  
 Acme Drug Co., Harriman, Tenn.  
 Yeomans, Sidney C.,  
 H. M. Sons of Rest,  
 Residence unknown.  
 Young, Andrew Palmerston,  
 153 Grand River ave., Detroit, Mich.  
 Young, Chas. C.,  
 C. S. O., Phil Div., Manila, P. I.  
 Young, Clarence C.,  
 Residence unknown.  
 Young, Cyrus Homer,  
 2361 N. High St., Columbus, Ohio.  
 Young, Fred. H.,  
 1759 Ainslie st., Chicago, Ill.  
 Young, Geo. O.,  
 Buckhannon, W. Va.  
 Young, Harry G.,  
 309 Harrison ave., Avalon, Pa.  
 Youngken, Dell Wallace,  
 2500 Jefferson st., Philadelphia, Pa.  
 Youngken, Heber W., Ph.G., A.B.,  
 A.M.,  
 5729 Springfield ave., Philadelphia,  
 Pa.  
 Zamora, Manuel,  
 913-915 Sebastian st., Manila, P. I.  
 Zeamer, Harry W.,  
 240 Locust st., Columbia, Pa.  
 Zeigler, Washington Hayne,  
 213 Rutledge ave., Charleston, S. C.  
 Zeluff, Irvin Simpson,  
 75 Barrow st., New York, N. Y.  
 Zieffle, Adolph,  
 Oregon Agriculture College, Cor-  
 vallis, Oregon.  
 Ziegler, Howard P.,  
 201 Windsor st., Reading, Pa.  
 ZIEGLER, PHILIP M.,  
 526 Penn st., Reading, Pa.  
 Zieske, Arthur, Ph.G.,  
 214 1st ave., S. W., Watertown, S. D.  
 Zimmerman, Theophilus,  
 Rose Free Dispensary, 7th & Cherry  
 sts., Terre Haute, Ind.  
 Zinn, Chas. E.,  
 300 W. 9th st., Kansas City, Mo.  
 ZOELLER, EDW. V.,  
 Main st., Tarboro, N. C.  
 Zoller, Glenn M.,  
 Thousand Island Pharmacy, Alex-  
 andria Bay, N. Y.  
 Zottman, Wm. H.,  
 1 Church st., Burlington, Vt.  
 Zuenckler, John F., Ph.G.,  
 2815 Highland ave., Cincinnati, O.  
 Zwick, Mary Hall (Mrs.),  
 511 S. Humphrey ave., Oak Park, Ill.

# GEOGRAPHICAL ROLL OF MEMBERS.

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## HONORARY MEMBERS

### FOREIGN COUNTRIES.

#### ENGLAND.

E. M. Holmes, F.L.S., *London*, 1899.

Henry George Greenish, *London*, 1913.

David Hooper, F.I.C., F.C.S., *Weston*, 1899.

#### GERMANY.

Dr. Arthur Meyer, *Marburg*, 1910.

Dr. Ernst Schmidt, Geh. Regierungsrath,

Dr. Herman Schelenz, *Cassel*, 1912.

*Marburg*, 1899.

#### SWITZERLAND.

Dr. Alexander Tschirch, *Bern*, 1910.

## ACTIVE MEMBERS

(List corrected to June 14th, 1915.)

Members are requested to report any inaccuracies in these lists, and to notify  
the General Secretary and Treasurer of all changes of address.  
(The names of Life Members in Capitals. Names of Life Members  
under the old Constitution in *italics*.)

### UNITED STATES OF AMERICA.

ALABAMA—ALASKA—ARIZONA—ARKANSAS.

<b>ALABAMA.</b>		<i>Tuscaloosa.</i>
<i>Athens.</i>		Bingham, William Ellison, A.B.,
Morris, Elisha Greene, Jr. ....	1914	Univ. of Miss. .... 1909
<i>Auburn.</i>		<i>Tuskegee.</i>
Blake, Lynn Stanford. ....	1914	Lewis, Lawrence Campbell. .... 1910
<i>Brewton.</i>		<b>ALASKA.</b>
Moseley, Jemison M. ....	1915	<i>Douglas.</i>
<i>Gadsden.</i>		Smith, Guy Livingstone. .... 1909
Vance, Winfield Scott. ....	1909	<i>Ketchikan.</i>
Whorton, Carl. ....	1908	Ryus, Floyd Eugene. .... 1909
<i>Guntersville.</i>		<b>ARIZONA.</b>
Thomason, William Pearce. ....	1910	<i>St. John's.</i>
<i>Lincville.</i>		Anderson, Albert Franklin, Ph.G. 1914
Rudd, Cicero. ....	1914	<b>ARKANSAS.</b>
<i>Mobile.</i>		<i>Batesville.</i>
Richold, Bernard Herbert. ....	1905	McMahon, Stonewall Jackson . 1914
Van Aller, Thomas S. ....	1907	<i>Brinkley.</i>
Van Antwerp, James Callanan. .	1905	Draper, Thomas J. .... 1914
<i>Montgomery.</i>		<i>Camden.</i>
McGehee, W. Boyd. ....	1914	MORGAN, AYLMER LEE. .... 1890
Williamson, J. Otis. ....	1914	<i>Center Point.</i>
<i>Prattville.</i>		Knox, James R. .... 1914
Scott, Clarence Alexander. ....	1905	<i>Clarksville.</i>
<i>Talladega.</i>		Warren, Robert Arthur. .... 1914
McDiarmid, Daniel Palmer. ....	1909	<i>Fort Smith.</i>
<i>Troy.</i>		Sparks, James Mitchell . 1894
Williams, Sam. A. ....	1914	

## ARKANSAS - CALIFORNIA

*Hope.*

Gibson, John Sceva..... 1908

*Hot Springs.*

Beasley, Robert Sidney..... 1906

Eisele, Martin Augustine..... 1907

Jennings, Algernon Coleman.... 1907

Klein, Ernest Frederick..... 1894

Lehman, Charles Walter, A.B.... 1907

Schachleiter, Francis George.... 1906

*Jasper.*

Arbaugh, Rufus C., Ph.G.... 1912

*Little Rock.*

Bond, John Barnitz, M.D., Surgeon C. S. A..... 1883

Fein, Mary A. (Miss)..... 1907

Hodges, Jesse D..... 1915

Snodgrass Latta Kavanaugh.... 1901

*Malvern.*

Chamberlain, Roy R..... 1914

*Paragould.*

Paris, James Ernest..... 1908

*Piggott.*

Potter, Maynard H., Ph.G., Ph.C. 1906

*Pine Bluff.*

DEWOODY, WILLIAM LAWRENCE 1887

*Stuttgart.*

Webb, John W..... 1913

*Van Buren.*

Whittington, Omar Harwell.... 1915

*Warren.*

Appleton, William Riley..... 1901

Davis, A. T. .... 1914

## CALIFORNIA.

*Alameda.*

Sutherland, George McKenzie... 1909

*Arcata, Humboldt Co.*

Keller, William Otto Emanuel.. 1908

*Auburn.*

Stevens, Frederick Solon..... 1903

*Bakersfield.*

Hughes, James A..... 1909

*Berkeley.*

Jaffa, M. E..... 1913

Laughlin, Carlisle..... 1915

Luck, Julius Alex. W..... 1910

Warner, William James..... 1913

*Corning.*

Dawson, Byron F..... 1909

*Eureka.*

Bohmansson, Robert Hugo..... 1901

Correll, Eugene Philip..... 1909

*Fort McDowell.*

Brown, Arthur E., Sgt. 1st Cl.

H. C..... 1911

Hamner, James Ferris..... 1906

*Fortuna.*

Bowman, Reginald Hamilton.... 1909

*Fresno.*

Smith, Geo. Henry..... 1909

*Fruitvale.*

Philip Waldemar Bruce, Ph.G.,

Phar.D..... 1907

*Gilroy.*

Johnson, Edward Franklin..... 1909

*Haywards.*

Sporndli, Ernest..... 1906

*Long Beach.*

Smith, Lauriston Stephen..... 1892

*Los Angeles.*

Binz, Edward Gabriel..... 1909

Guest, Wilbert Hillman..... 1909

Howard, Mrs. Fletcher..... 1905

Kirkland, Derwentwater..... 1889

Reilly, Robert C..... 1901

Sauvinet, Charles D..... 1902

Schiff, Ludwig..... 1912

Watters, Alexander John..... 1909

*Menlo Park.*

Selzer, Mary E. (Mrs.)..... 1914

*Monterey.*

Herman, Christopher..... 1913

*Mountain View.*

Wagner, Louis..... 1908



## CALIFORNIA -COLORADO.

*Oakland.*

Leet, Robert Andrew.....	1907
Varney, Edward Francis.....	1892

*Orland, Glenn Co.*

Birch, May Cushman.....	1909
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*Pasadena.*

Leavitt, Adoniram Judson.....	1905
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*Patton.*

Dyna, Carl Frederick Julius, Ph.G.....	1909
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*Riverside.*

Porter, G. Ellis, A.B.....	1909
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*Sacramento.*

Kirk, H. S. ....	1913
Lichthardt, George Henry Philip, Ph.G.....	1902
Siegel, Harry Jacob.....	1912

*San Anselmo.*

Hund, George Bernard.....	1910
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*San Diego.*

Rosseau, Joe C.....	1914
Strahlmann, Edward.....	1909

*San Francisco.*

Baer, Edward Arthur.....	1907
Barbat - Winslow, Josephine (Mrs.).....	1915
Bost, W. D.....	1914
Bowerman, Kenneth Burton....	1909
Boyken, John William.....	1902
Boyson, John Henry.....	1905
Briggs, Armand Eugene.....	1907
Carey, Henry Benjamin.....	1909
Cordivenus, W. M.....	1915
Dawson, John Henry, Ph.G....	1882
Fletcher, David M.....	1904
Flint, John Henry.....	1909
Goodman, Philomena (Mrs.)....	1914
Green, Franklin Theodore.....	1908
Guerich, Waldermar.....	1915
Harris, Samuel J., Sgt. H. C., U. S. A.....	1912
Headen, Claude Thomas, Ph.C....	1909
Jorgenson, Edward B.....	1902
Lackenbach, Fred Isadore, Ph.C.	1907

Lengfeld, Joseph Louis.....	1909
Low, Harry (Mrs.).....	1914
McDonnell, Herbert Leslie, Ph.G.	1908
Musante, Attilio Stephen.....	1915
Poehner, Adolf Adam, Ph.G., M.D.....	1907
Prior, Toney.....	1905
Reum, Arthur William.....	1910
Roehr, Clarissa May.....	1908
Rogers, Edward.....	1902
Schmidt, Valentine, B.S., M.S., M.D., Ph.D.....	1887
Schneider, Albert, B.S., M.S., M.D., Ph.D.....	1899
Simmons, Haydn Mozart.....	1915
Stange, Carl Frederick, Ph.G....	1897
White, Jennie M.....	1914
Winter, James Henry.....	1904

*Sanger.*

Brehler, Oscar August.....	1909
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*San Jose.*

Cost, Anthony C.....	1915
Dore, Cornelius W.....	1915
Munson, James Grant.....	1908
O'Gorman, Theophilus Vincent..	1897
Pellerano, Nicholas Andrew.....	1909

*Sebastopol.*

Worth, Thomas Renfro.....	1909
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*South Berkeley.*

McGee, Stewart Thomas.....	1912
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*Turlock.*

Hudiberg, Alfred, Ph.C.....	1912
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*Vacaville.*

Farrell, Anna Marie (Miss)....	1914
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*Vallejo.*

Hammar, Alrick, Chief Pharma- cist, U. S. Navy.....	1897
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## COLORADO.

*Akron.*

Van Liew, William Kirk.....	1913
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*Aspen.*

Killey, Robert Smith, Ph.G....	1913
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## COLORADO—COLUMBIA, DISTRICT OF.

*Boulder.*

Fine, Eben Givens..... 1913  
 Washburn, Homer Charles..... 1905

*Central City.*

Davies, Llewellyn Powell..... 1891

*Colorado City.*

Berg, Frantz F..... 1914  
 Meyer, Walter Ferdinand..... 1913

*Colorado Springs.*

Butcher, David Yerbey..... 1910

*Craig.*

Downs, Fred Clayton..... 1913

*Cripple Creek.*

Lewis, Griffith R..... 1909

*Denver.*

Alkire, Lewis L..... 1908  
 BEST, JOHN..... 1886  
 Beukma, William..... 1913  
 Bresler, Simon L..... 1908  
 Charles, Corlis Duffy..... 1913  
 Clark, Alfred William..... 1908  
 Clayton, Charles J..... 1905  
 Cordes, Henry..... 1913  
 Givens, Milton P., Jr..... 1915  
 Griebbling, Frank A..... 1914  
 Hensel, Samuel Theodore, Ph.G. 1913  
 Hover, William Adgate..... 1895  
 Hover, William Tracy..... 1913  
 Jeancon, Louis Augustus..... 1912  
 Lagassé, Victor Scott..... 1912  
 Lord, Frank Jotham..... 1912  
 Martin, John Albert..... 1909  
 McKenzie, Robert Henry, Ph.G. 1908  
 Nitardy, Ferdinand Wilhelm... 1905  
 Payne, Winfield Scott, B.A..... 1913  
 Pillsbury, Arthur Lee..... 1914  
 Powers, Emmett..... 1912  
 Ryan, Alonzo S..... 1913  
 Schenck, Fannie (Mrs.)..... 1906  
 Schoder, Carl Eugene..... 1914  
 Scholtz, Edmund L..... 1909  
 Scholtz, William O..... 1913  
 Secheverell, Hugh Bennett..... 1913  
 Seymour, James..... 1903  
 Strickland, Bert W..... 1913  
 Swoboda, Adolph..... 1909

Tillotson, Ward C..... 1914  
 WALBRACH, ARTHUR..... 1881  
 Wilson, Lincoln..... 1910

*Fort Collins.*

Scott, Alexander Weir..... 1906

*Fort Logan.*

Mathews, E. D., Sgt. 1st Cl.  
 H. C. U. S. A..... 1912

*Fowler.*

Palmer, William Gordon..... 1909

*Lafayette.*

Dow, John Peter..... 1904

*Lamar.*

Woods, Samuel Ross, Ph.G..... 1913

*Las Animas.*

Rupert, J. F..... 1913  
 Winterbottom, James Albert... 1915

*Leadville.*

Kolsch, Julius..... 1902  
 Whitmore, George Comings.... 1912

*Longmont.*

Witting, Frederick Frank, Ph.G. 1902

*Pueblo.*

Mortenson, Frank Emil, Ph.G... 1910

*Salida.*

Bode, Theodore Christian..... 1912

*Steamboat Springs.*

Green, William W..... 1913

*Sterling.*

Bauman, Charles R..... 1913

## COLUMBIA, DISTRICT OF.

*Anacostia.*

Weiss, Conrad Henry..... 1906

*Washington.*

Alsberg, C. L., A.B., A.M., M.D. 1912  
 Beall, Herbert Ninian..... 1915  
 Bradbury, Wymond Henry,  
 Phar.D..... 1895  
 Brown, Clark L..... 1911  
 Davis, Harry Alexander..... 1911

## COLUMBIA, DISTRICT OF—CONNECTICUT—DELAWARE—FLORIDA

Flemer, Louis.....	1895	<i>Norwalk.</i>	
Floyd, Henry Bussey.....	1908	Glendering, Harold.....	1915
Franzoni, Joseph Dunbar.....	1900	<i>Simsbury.</i>	
Fuller, Henry Corbin.....	1915	Lathrop, Arthur E.....	1910
Garrels, Charles.....	1914	<i>Stamford.</i>	
Henkel, Miss Alice.....	1902	Weicker, Theodore.....	1905
Henry, Frank Clinton.....	1894	<i>Waterbury.</i>	
HILTON, SAMUEL LEWIS, PHAR.D.	1890	Wilcox, Levi, Ph.B.....	1903
Hubbard, Winfield Scott, Ph.G.,		<i>Willimantic.</i>	
B.S., M.A., Ph.D.....	1912	Cartier, Gustave O.....	1913
Jongeward, Mattys.....	1915		
Kalusowski, Henry E.....	1904		
Kebler, Lyman Frederic.....	1894		
La Grange, John V., A.M., Ph.G.	1905		
Merrill, Edward C.....	1914		
Quigley, Richard Lucien.....	1902		
Rabak, Frank.....	1905		
Richardson, Willard Stowell....	1900		
Scott, Edgar Burroughs.....	1905		
Sievers, Arthur.....	1906		
Spire, William Barton, Ph.D....	1908		
Stockberger, Dr. Warner W.....	1914		
Vane, Patrick P.....	1911		
Viehoever, Arno, M.D.....	1915		
Waters, Morris Wilson.....	1915		
Weller, Franklin Pierce.....	1900		
White, Joseph Leyden.....	1909		
WILBERT, MARTIN INVENTIUS..	1902		
Wiley, Harvey Washington.....	1902		

## DELAWARE.

*Clayton.*

Keys, Walter R..... 1915

*Fort Dupont.*

Knapp, Gustav..... 1912

*Newark.*

Rhodes, George W..... 1915

*Seaford.*

Kaufman, Reuben M., Ph.G.... 1909

*Wilmington.*

Bosley, John Oliver..... 1914

WATSON, HERBERT KENNEDY.. 1888

## CONNECTICUT.

*Bridgeport.*

Jamieson, George Alexander....	1903
Leverty, John Augustine.....	1900
Ostrosky, Frank Joseph.....	1910
Synder, Alfred Harrington.....	1915

*Hartford.*

Gladding, Curtis Parsons.....	1912
Rapelye, Charles A.....	1915
Seinsoth, John Jacob.....	1900
Stoughton, Mary A. (Mrs.)....	1913

*Middletown.*

PITT, JOHN RICHARD.....	1872
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*New Haven.*

GESSNER, EMIL ADOLPH . . . .	1878
Jenkins, Edward H.....	1913
Spalding, Clarence Gilman.....	1910
Wood, James Prior.....	1890

## FLORIDA.

*Bartow.*

Oglesby, Robert McGrady..... 1914

*Brooksville.*

Lemasters, William Otterbein... 1905

*Daytona.*

Clark (Mrs.), Aaron P..... 1914

*De Land.*

Fisher, George Washington..... 1893

*Gainesville.*

Johnson, Washington M..... 1910

*Hemestead.*

Henry, Arthur Malcolm, B.S.... 1913

*Jacksonville.*

Jones, William D..... 1913

Stewart, Harry E... 1913

## FLORIDA—GEORGIA—HAWAIIAN ISLANDS—IDAHO—ILLINOIS.

*Key West.*

Miller, Charles..... 1897

*Ocala.*

Groves, Henry Conrad..... 1903

*Palatka.*

Ramsaur, David Wilfong..... 1902

*Pensacola.*

Berkowitz, Morris E..... 1910

De Alemberte, Herbert Harry... 1915

Hannah, Malcolm E..... 1914

Petterson, Ernest Wilhelm..... 1905

*Punta Rassa.*

Shultz, Martin Elliott..... 1915

*Satsuma Heights.*Richtmann, William Oscar,  
Ph.G., B.S..... 1904*St. Augustine.*

Speer, Charles Claude..... 1902

*Tampa.*

Berger, Ernest..... 1902

Taylor, Milton M..... 1915

## GEORGIA.

*Athens.*

Wilson, Robert C..... 1915

*Atlanta.*

Bowie, Theo. (Miss)..... 1914

Elkin, William Simpson..... 1905

Jacobs, Sinclair Sartorius..... 1915

Payne, Dr. George Frederick.... 1893

Stallings, Robert Emmett..... 1914

*Augusta.*

Byers, Jason D., Sgt. 1st Cl.

H. C. U. S. A..... 1912

Land, Robert Henry..... 1859

Land, Robert Henry, Jr..... 1902

*Dodge.*

Brower, Thos. E..... 1912

*Macon.*

Morris, Max, Ph.G..... 1898

*Ocala.*

Smith, Isaac Clifton..... 1913

*Rome.*

Martin, Albert E..... 1914

*Savannah.*

Brigham, Lawrence Stanton ... 1914

Pruett, A. R..... 1915

Rowlinski, Robert Antone..... 1892

Solomons, Isaiah Abraham..... 1894

Solomons, Isaiah, Jr..... 1913

*Thomasville.*

Jerger, Henry Louis, Jr..... 1915

Thomas, Robert, Jr..... 1888

## HAWAIIAN ISLANDS.

*Honolulu.*

Smith, George W..... 1915

## IDAHO.

*Boise.*

Ballou, Clarence Orlando..... 1909

*Midvale.*

L. Raymond Tyson..... 1912

*Pocatello.*

Buehler, John J..... 1913

Whittlesey, Henry Hawley..... 1910

*Twin Falls.*

Spargur, Ray Miles..... 1910

## ILLINOIS.

*Arrowsmith.*

Lester, George Friend..... 1910

*Aurora.*

Frauenhoff, Frederick Louis, Ph.G. 1909

Staudt, Louis Carl, Ph.G..... 1890

*Batavia.*

Schreiner, Albert..... 1914

Schreiner, Albert, Jr..... 1915

*Blue Island.*

Dorjahn, John A..... 1914

*Cairo.*

Metzger, Arthur S., Ph.G., Ph.C. 1908

Schuh, Paul Gustav..... 1894

*Camp Point.*

Bartells, George C..... 1881



## ILLINOIS.

<i>Canton</i>		Grassly, Charles William.....	1884
Webster, Richard C.....	1914	Gray, Margaret McClintock	
<i>Chicago.</i>		Mrs.....	1901
Ackermann, Albert George, Ph.G.	1909	GRAY, WILLIAM.....	1892
Adamick, Gustave Hattenhauer.	1891	Haessler, Loren M.....	1906
Anderson, Carl Godfrey.....	1907	Hartwig, Otto Julius.....	1892
Avery, Charles Hamilton.....	1905	Hellmuth, Joseph Anthony.....	1905
Backus, Edwin John.....	1913	Hermanek, Joseph Charles.....	1904
Baker, Samuel Leon.....	1915	Hilpert, Willis Stose.....	1908
Barrett, Marcus.....	1912	Holthoefer, Herman John.....	1912
Bartlett, James E.....	1906	Hood, Harry Alling.....	1910
<i>Bartlett, Nicholas Gray.</i> .....	1861	Hottinger, Otto George.....	1910
Bate, Henry John.....	1906	Hoover, George William.....	1905
Becker, Irwin Atwood, B.S.,		Hunsche, Frederick.....	1915
Ph.G.....	1905	JAMIESON, THOMAS NEVIN.....	1903
Behrens, Emil Christian Lewis..	1893	Jehlik, Anton Josef.....	1906
Blocki, John.....	1909	Josenhans, Reinhardt, C. J.,	
Bodemann, Wilhelm.....	1906	Ph.C.....	1907
Boehm, John J.....	1905	Kraemer, George Charles.....	1913
Brunn, Harold Nicholas.....	1905	Kramer, Wilhelm.....	1908
Burdick, Alfred S., M.D.....	1913	Kuehn, Wm.....	1914
Burdick, Merle M.....	1913	Ladish, Erich Herman.....	1905
Buss, Oliver C.....	1915	Larsen, L. P., Ph.G.....	1908
Caldwell, A. C.....	1915	Loesch, William.....	1912
Canham, George E.....	1915	Long, John Harper.....	1915
Christensen, Henry C.....	1906	Mahaffy, John A.....	1913
Clark, Albert Henry, Ph.G.....	1905	Mares, Frank Martin, Ph.G....	1902
Colson, Henry W.....	1913	Matthews, Charles Edwards....	1893
Combs, Delta E.....	1911	McConnell, Charles Henry.....	1899
Cooban, Benjamin Slater.....	1902	McCausland, Harloven H.....	1913
Craig, Hugh.....	1907	Meyer, Frederick Hugo.....	1907
Crowley, James Patrick.....	1908	Miller, Albert, Ph.G.....	1907
Day, William Baker, Ph.G.....	1895	MINER, MAURICE ASHBEL, Ph.C.,	
Elisburg, Louis A.....	1913	Phar.D.....	1880
Engelhard, George Pierre.....	1903	Morrisson, James William.....	1912
Fantus, Bernard, M.D.....	1908	Mrazek, Leo Ludwig.....	1914
Fenger, Frederic.....	1910	Orr, Charles C.....	1915
Fischnar, John Ferdinand.....	1905	Patterson, Charles Waggener...	1905
Forbrich, Charles Anthony.....	1913	<i>Patterson, Theodore Henry.</i> .....	1869
Forster, Isadore A.....	1912	Potts, Thomas Humphreys.....	1906
Fry, Herman.....	1902	Provost, Frederick.....	1914
Fry, Narcys George.....	1906	Puckner, William August, Ph.G.,	
FULLER, OLIVER FRANKLIN.....	1869	Phar.D.....	1888
Gathercoal, Edmund Norris,		Raycraft, Joseph Winfred.....	1915
Ph.G.....	1905	Rhode, Rudolph Ernst.....	1887
Genochio, Edward Peter.....	1914	Riemenschneider, Julius H.....	1915
Gibson, Frank L.....	1904	Roe, Roy C.....	1915
Gordin, Henry Mann, Ph.D.....	1899	Sass, Stephen Konrad.....	1905
Gordon, Jean (Miss).....	1914	Schapper, Ferdinand C.....	1913
		Scheips, Theodore I.....	1905

## ILLINOIS.

Scherer, Andrew, Ph.G.....	1884
Schmid, Rose Phillipus.....	1911
Schmidt, Frederick Michael, Ph.G.....	1887
Schulz, Henry Lewis.....	1905
Sethness, C. Henry.....	1914
Sheblessy, Michael Albert.....	1909
Snow, Clyde Mason, Ph.G., M.A.....	1903
Snow, Herbert Waldemar, Ph.C.	1912
Snyder, Forrest Omo.....	1915
Snyder, William Edward, Ph.G.	1909
Stadelmann, Harry Edgar.....	1909
Stephan, Otto Paul, Ph.G.....	1909
Storer, Charles Adelbert.....	1906
Stuchlik, John.....	1913
Summers, Franklin Peale.....	1913
Tabenski, Longin, Ph.G., M.D..	1915
Trienens, Joseph.....	1915
Umenhofer, Adolph.....	1908
Van Schaack, Cornelius Peter...	1905
Vaupell, George F., Ph.C.....	1915
VOISS, ARCADIUS.....	1901
Vorsanger, Lillian.....	1915
Warren, Louis Eugene.....	1909
Wells, James Herbert, Ph.G., LL.B.....	1908
WILLIAMS, SEWARD WHITING...	1887
Wilson, Charles Frazee.....	1906
Young, Fred H.....	1913

*Clayton.*

Watson, Elmer A.....	1915
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*Du Quoin.*

Bianco, Mike Robert.....	1915
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*East St. Louis.*

Knoebel, Percy Thomas.....	1907
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*Elgin.*

Schultz, Charles Frederick Wm..	1911
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*El Paso.*

Michels, John B.....	1913
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*Evanston.*

Lee, John Victor.....	1910
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*Fairmount.*

Tilton, Claude Enoch.....	1905
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*Forest Park.*

Jacob, Charles William.....	1914
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*Freeport.*

McNess, Frederick Wm., P.D...	1906
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*Geneseo.*

Stamm, Dante Milton.....	1896
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*Girard, Macoupin Co.*

Deck, Lewis Cass.....	1901
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*Grayville.*

Wheatcroft, John Christopher..	1912
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*Greenup.*

Conzet, Rufus Warren.....	1904
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*Harrisburg.*

Gregg, Thos. D.....	1914
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*Lockport.*

Mackenhimer, Don G., Ph.G...	1906
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*Mascoutah.*

Dauber, Curt Louis.....	1913
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*McLean.*

VanNess, George Ide.....	1904
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*Moline.*

Anderson, Adolph Emil.....	1913
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Brunstrom, Charles, Ph.G.....	1912
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Lindvall, Charles Gustaf.....	1897
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Sohrbeck, George Henry.....	1888
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Sohrbeck, George Wm., Ph.G...	1897
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*Mt. Vernon.*

Morse, Edward Worth.....	1896
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*Oak Park.*

Dreyfus, H. W.....	1914
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McCauley, Charles Edward.....	1903
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Zwick (Mrs.) May Hall.....	1914
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*Pekin.*

Ehrlicher, Henry Michael.....	1892
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*Peoria.*

Benton, Wilbur Merritt.....	1888
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Fieselmann, Sidney Frederick..	1914
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Kimlel, J. Edward.....	1915
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Weinkauff, Jacob.....	1914
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*Pesotum.*

Hoffmann, Geo. Frederick, Ph.G.	1902
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## ILLINOIS INDIANA.

<i>Pontiac.</i>		<i>Auburn</i>	
Butler, Frank J.	1914	Shugers, Walter R.	1915
<i>Quincy.</i>		<i>Bloomington.</i>	
Dickhut, Lawrence August, Ph.G.	1910	Wiles, Wood	1914
Hagemann, Wm Herman, Ph.G.	1910	<i>Bluffton.</i>	
Heidbreder, Albert Henry	1905	Stout, Marion Alphon, Ph.G.	1906
<i>Rock Island.</i>		<i>Columbia City.</i>	
Hartz, William Theodore	1909	Eberhard, Homer	1915
Walker, Frederick Douglas Gar-		<i>Columbus.</i>	
nett, Ph.G., Opt.D.	1912	Otto, Theodore Gotthelf Edward	1909
<i>Rockford.</i>		Stahlhuth, Ernst Heinrich Wil-	
Freburg, Amel E.	1910	helm, Ph.G. (Cincinnati)	1887
<i>Rosiclare.</i>		<i>Converse.</i>	
Paris, William John James	1913	Gift, Wendell J.	1913
<i>Salem.</i>		<i>Elkhart.</i>	
Sweeney, A. J.	1911	Beardsley, Andrew H.	1913
<i>Springfield.</i>		<i>Evansville.</i>	
Dodds, Frederick Clinton, Sec'y		Bohn, George W.	1907
Ill. State Board Pharm.	1913	Brown, George Wilton	1914
Dodds, Richard Newton	1902	Hardigg, William L.	1913
<i>Spring Valley.</i>		<i>Farmersburg.</i>	
Garrity, Jeremiah G.	1914	Barbre, John Vandever, Jr.	1910
<i>Stronghurst, Henderson Co.</i>		<i>Hammond.</i>	
Harter, Isaac Foster, M.D.	1893	Beach, DeMott Clark	1915
<i>Tuscola.</i>		<i>Indianapolis.</i>	
Stacy, Marion Franklin	1903	Bartholomew, William C.	1913
<i>Urbana.</i>		Bibbins, Francis Eugene, Ph.G.	1909
Beal, George Denton	1907	Blodau, Robert P.	1908
Beal, James H., Sc.D., Phar.D.	1892	Carter, Frank Henry	1901
Creighton, Mary L. (Miss)	1903	Carter, Harlen Wilson Searight	1913
<i>Valle.</i>		Eberhardt, Ernest Godlove,	
Clark, Amos W., Sgt. 1st Cl. H.		Ph.G.	1906
C., U. S. A.	1913	Eckler, Charles Ralph	1903
INDIANA.		Eldred, Frank Randall	1905
<i>Albion.</i>		Hall, A. B.	1914
Miller, Charles Elliott	1899	Huder, Henry J.	1894
<i>Angola.</i>		Hurty, John Newell, M.D.,	
Sherrard, Charles Cornell	1893	Phar.D.	1882
		Kassulke, August	1905
		Lilly, Eli	1906
		Lilly, Josiah Kirby	1890
		Lynn, Charles Jackson	1906
		Miller, Fred Anderson	1913
		Miller, Joy Lowell	1912

## INDIANA—IOWA.

Mueller, J. George.....	1906	<i>South Bend.</i>	
Niles, Edward Hulbert.....	1914	Bastian, Otto Carl.....	1903
Parker, Mayne E.....	1915	Reyer, Emil, Ph.G.....	1907
Pfafflin, Henry Adolph.....	1892	<i>Terre Haute.</i>	
Pruyn, Murry K.....	1912	Denison, Arthur E.....	1915
Schwartz, Maurice Paul.....	1906	Zimmerman, Theophilus.....	1914
Showalter, Ralph W.....	1913	<i>Tipton.</i>	
Stucky, Edward W., Ph.B., A.M.....	1908	Porter, Jesse G.....	1915
Thorburn, Albert David.....	1902	<i>Troy.</i>	
Watkins, Charles William.....	1907	Gaesser, Theobald Theodore, Ph.G.....	1901
Werner, William F.....	1908	<i>Valparaiso.</i>	
<i>Kouts.</i>		Heineman, Albert F.....	1905
Benkie, John Gottlieb.....	1910	Roe, Joseph Newton.....	1902
<i>Lafayette.</i>		Speer, William O.....	1915
Best, Frank Merrell.....	1914	Timmons, George Demming, Ph.G., B.S., Ph.C.....	1905
Dewey, Albert Haskin, Ph.G., B.S., M.S.....	1909	Wisner, Ebert H.....	1914
Gidley, William Francis, Ph.C., B.S.....	1910	<i>Warren.</i>	
Jordan, Charles B., Ph.C., B.S., M.S.....	1909	Adams, D. Brice.....	1915
Mayfield, E. Carl.....	1915	Hickerson, William Henry.....	1894
Schultz, John Jacob.....	1904	Tam, Merrit W.....	1915
<i>La Porte.</i>		<i>West LaFayette.</i>	
Meissner, Frederick William, Jr., Ph.G.....	1890	Groom, John I.....	1915
<i>Logansport.</i>		<i>West Terre Haute.</i>	
Hoffman, George William.....	1904	Cassady, Burton.....	1909
<i>Marion.</i>		<i>Winchester.</i>	
Fansler, Beatrice W.....	1915	Sala, Albert Franklin.....	1905
<i>Martinsville.</i>		<b>IOWA.</b>	
May, Edwin W.....	1914	<i>Amana.</i>	
<i>New Albany.</i>		Koch, August Frank, Ph.G.....	1903
Knoefel, Bruno.....	1896	Schadt, Conrad, R.P.....	1903
<i>Notre Dame.</i>		<i>Ames.</i>	
Green, Robert Lee.....	1906	Gaessler, William George.....	1912
<i>Rockport.</i>		Judisch, George.....	1913
Basye, Taylor Colman.....	1909	<i>Anthon.</i>	
<i>Salem.</i>		McNiff, Frank J.....	1915
Rudder, William Hiram, Ph.G..	1907	<i>Audubon.</i>	
<i>Seymour.</i>		Frick, Daisy Adelaide.....	1914
Loertz, Carl Edward.....	1907	<i>Belle Plaine.</i>	
Osterman, Henry.....	1914	Mall, F. A.....	1913



## IOWA—KANSAS.

<i>Boone.</i>			
Herald, Mansfield B.	1915	Kuever, R. R., Ph.G., Ph.C.	1912
Ridgway, Lemuel Augustus	1882	Kullman, Karl William	1914
<i>Callender.</i>		Teeters, Wilber John	1902
Larson, Martin	1906	Utterback, Earl	1913
<i>Clear Lake.</i>		<i>Keokuk.</i>	
Eitzel, John Leonhardt	1897	Kiedaisch, George Arthur	1904
<i>Clinton.</i>		Parsons, George L., Ph.G.	1912
John, Milo Jesse	1910	<i>Klemme.</i>	
<i>Davenport.</i>		Powell, Muzelle	1915
BALLARD, JOHN WINTHROP,		<i>Lowden.</i>	
PH.G.	1871	Jurgensen, Peter H.	1911
Burnside, Carl Bishop	1913	<i>Maquoketa.</i>	
<i>Delmar Jct.</i>		Staack, Hugo F.	1915
Westpfahl, Ernest W.	1915	<i>Marshalltown.</i>	
<i>Denison.</i>		Mayer, Peter	1906
Schlumberger, Anna Babette	1913	<i>Muscatine.</i>	
Schlumberger, Philip August	1913	Halstead, Alice Louisa (Mrs.)	1892
<i>Des Moines.</i>		<i>Red Oak.</i>	
Berner, Carl Albert	1903	Casey, D. W.	1915
Chittick, Geo. H.	1914	<i>Sioux City.</i>	
Kagy, Elbert O., Ph.G., Ph.C.	1913	SCHERLING, GUSTAV, Ph.G.	1884
Redfern, Ellsworth Lovejoy,		Soper, George M.	1909
B.S.	1913	Thompson, Edwin Thomas	1913
Stinson, Hugh	1915	Todd, Joseph A.	1914
Weeks, Carl	1915	<i>Solon.</i>	
<i>Dow City.</i>		Rogers, Blanche I.	1915
Anderson, Ingewald A., Ph.G.	1913	<i>Winfield.</i>	
<i>Ft. Dodge.</i>		Lindly, John Milton, Phar.D.	1901
OLESON, OLAF MARTIN	1877	<b>KANSAS.</b>	
<i>Ft. Madison.</i>		<i>Atchinson.</i>	
Axt, J. H.	1915	Noll, Mathias, Ph.C.	1901
SCHAFER, GEORGE HENRY	1871	<i>Ellsworth.</i>	
<i>Homestead.</i>		Sherriff, William Ebenezer	1904
Miller, Frederick William	1902	<i>Ft. Leavenworth.</i>	
<i>Hull.</i>		Hardenbrook, Burton	1912
Coad, William A	1911	<i>Gypsum City, Saline Co.</i>	
<i>Iowa City.</i>		Schmitter, Jonathan	1892
BOERNER, EMIL LOUIS	1877	<i>Havana.</i>	
Cooper, Zada Mary, Ph.G.	1909	Lindley, Patrick H.	1913
Doden, Herbert F.	1915		

## KANSAS—KENTUCKY.

<i>Humboldt.</i>		<i>Fort Thomas.</i>	
Hess, W. I.....	1913	Shull, George J.....	1913
<i>Lawrence.</i>		<i>Frankfort.</i>	
Havenhill, L. D.....	1900	Averill, Thomas P.....	1915
LEIS, GEORGE.....	1869	Gayle, John William.....	1891
Moore, John Thomas.....	1888	<i>Hawesville.</i>	
Sayre, Lucius Elmer.....	1883	Patterson, George Orville.....	1907
Sterling, Charles Morgan, A.B.....	1911	<i>Henderson.</i>	
Stevenson, Arthur Earl.....	1912	Elam, John Thomas.....	1907
Varnum, Walter Howard.....	1912	<i>Lexington.</i>	
Watson, George Nathaniel.....	1910	Brown, Linwood Arnold, Ph.C.,	
<i>Manhattan.</i>		Pharm.D.....	1909
Needham, Robert Hamilton.....	1906	Caden, Alice.....	1913
<i>Marysville.</i>		Cassell, Robert Lee.....	1910
Riesen, David V.....	1909	Harting, Rudolph R.....	1902
<i>Overbrook.</i>		Porter, Chilton Scott.....	1914
Topping, Arthur Ellsworth, Ph.G.	1904	<i>Louisville.</i>	
<i>Scandia.</i>		Albus, Charles I.....	1915
Nywall, David Alfred, B.S.,		Buschemeyer, Henry, Jr.....	1909
Ph.G.....	1910	Curry, Gordon Laten.....	1915
<i>Troy.</i>		DIEHL, CONRAD LEWIS, Ph.M.....	1863
Sinclair, Edward Albert, Ph.C.....	1913	Dilly, Oscar Charles.....	1888
<i>Wichita.</i>		Dimmitt, Addison.....	1895
Chism, John Samuel, Ph.G.....	1909	Eisele, George.....	1908
Fields, J. Larkin.....	1915	Gould, George H.....	1914
Frazier, William John.....	1909	Hurley, Horace Oliver.....	1907
<i>Winfield.</i>		JONES, SIMON NEWTON.....	1870
Bird, Richard B.....	1910	Miersch, Rudolph Victor.....	1915
Friedenburg, Maximilan Wilmer	1904	Mueller, Otto Edward.....	1907
KENTUCKY.		Newhall, Bert A.....	1914
<i>Anchorage.</i>		NEWMAN, GEORGE ABNER.....	1866
Haeusgen, Henry Otto.....	1915	Seiberz, John J.....	1915
<i>Augusta.</i>		Schlosser, Peter.....	1902
Bertrams, Henry.....	1914	Suter, Arthur Lee.....	1915
<i>Columbus.</i>		Votteler, William.....	1895
Summers, R. C.....	1914	Weiss, William J.....	1910
<i>Covington.</i>		<i>Mayfield.</i>	
Eichler, Henry.....	1913	Evans, Leon.....	1915
Kutchbaugh, John Frederick,		<i>Midway.</i>	
Ph.G.....	1904	Morris, W. C.....	1915
Pieck, Edward Ludwig.....	1887	<i>Newport.</i>	
		Bange, Otto Franz.....	1904
		Blank, Nicholas J.....	1915
		Greule, Albert Martin.....	1903
		Widsig, T. J.....	1915

## KENTUCKY—LOUISIANA MAINE

*Owenboro.*

Danhauer, William Edward..... 1914

*Paducah.*

Welsh, Joseph Bruner..... 1910

*Varsailles.*

Berryman, Robert..... 1915

## LOUISIANA.

*Homer.*

Wafer, John Gill..... 1915

*Kentwood.*

Carruth, Luther E..... 1914

*Monroe.*

Callens, John W..... 1915

*Natchitoches.*

McClung, E. L..... 1910

*New Orleans.*

Asher, Philip..... 1905

Burvant, Emil J..... 1915

Earhart, Frederick A..... 1904

Feldner, George D..... 1913

Gahn, Henry..... 1902

Godbold, Fabius Chapman..... 1887

Grace, Robert F..... 1914

Grasser, John J..... 1909

Kaczoroski, Adolph O..... 1909

Legendre, Joseph Amilcar..... 1891

Lyons, Lucien Eugene..... 1904

Metz, Abraham Lewis..... 1887

Posey, Henry Gibson..... 1914

Sampson, Max..... 1900

Taylor, James Hickey..... 1914

Walker, Joseph Patrick..... 1909

Walsdorf, Edward H..... 1904

Welch, Sister Mary Bernard... 1913

Wirth, Adam, Ph.M..... 1904

Wunderlich, Edward..... 1891

*Shreveport.*

Hudson, Wm. G..... 1914

Peyton, Joe Wharton..... 1914

## MAINE.

*Auburn.*

Burnham, Ralph Foster..... 1904

Jones, Oscar Winthrop..... 1902

*Augusta.*

Coughlin, John..... 1908

Patridge, Frank Reuben..... 1895

*Bangor.*

Davis, Charles Howard..... 1903

Sweet, Caldwell..... 1881

*Bath.*

Dougherty, Daniel T..... 1914

*Danforth.*

Porter, Martin Luther..... 1904

*Fort Fairfield.*

Buxton, Horace Childs..... 1910

*Kennebunk.*

Meserve, Albert Wesley, A.M.,

B.A..... 1905

*Lewiston.*

Babcock, Percival Warren..... 1909

*Machias.*

Crane, Frank Trussell, Ph.G... 1910

*Portland.*

Cook, Alfred Page..... 1902

Everett, Edward S..... 1915

FRYE, GEORGE CARLTON..... 1879

Hay, Edward Allston..... 1889

Schlotterbeck, Augustus George. 1896

Tuttle, George O..... 1907

*Presque Isle.*

Osborne, William, Jr..... 1913

*Richmond.*

McKinney, Franklin Ray... 1914

*Rumford.*

Cowan, Ernest L..... 1914

*Skowhegan.*

Bucknam, Frank William..... 1907

*South Paris.*

Howard, Chas. H..... 1915

*South Poland.*

BILLINGS, HENRY M..... 1869

## MARYLAND.

## MARYLAND.

*Annapolis.*

Henkel, Charles Bernard.....	1902
Pearson, Joseph Frederick, Chief Pharm. U. S. Navy.....	1897

*Arlington.*

Roberts, Jos. C.....	1910
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*Baltimore.*

Balmert, Clemens Augustus, Phar.D.....	1909
Base, Daniel, A.B., Ph.D.....	1898
Black, James Aitken, Phar.D...	1910
Boyles, Frank Morris.....	1914
BRACK, CHARLES EMIL.....	1876
Caspari, Charles, Jr.....	1883
Cole, Bessie Olive.....	1915
Cook, Parker.....	1910
Daneker, Howard Nelson.....	1907
Dickson, Frederick W.....	1906
Dohme, Alfred Robert Louis...	1891
Donnet, John Smith.....	1915
Dunning, Henry Armit Brown, Phar.D.....	1902
Engelhardt, Hermann.....	1907
Fouch, William M.....	1906
Frames, John Fuller, Ph.G.....	1890
Gilpin, Henry Brooke.....	1889
Griesemer, L. P.....	1913
Hancock, James Etchberger....	1907
HANCOCK, JOHN FRANCIS.....	1863
Harrison, Harry S.....	1915
Heusler, Philip Ignatius.....	1903
Hodson, Eugene Withers.....	1907
Hynson, Henry Parr.....	1890
Kantner, Leahmer M.....	1914
Kelly, Evander Frank, Phar.D..	1905
Lowry, William J., Jr.....	1906
Maisch, Henry.....	1898
Mansfield, Samuel.....	1898
Meyer, Charles Lewis.....	1901
Millard, David Rockwell.....	1899
Miller, Clifford O., Phar.D.....	1912
Muchlause, Otto W.....	1915
Muth, George Giustiniani.....	1906
Muth, John Clement.....	1898
Muth, John Sebastian.....	1898
Neal, Charles Chaplin.....	1906
Patterson, Annie M.....	1915

Schulze, Louis, Ph.G.....	1892
Schumann, Otto George.....	1902
Shulman, Jacob A.....	1910
Smith, Theodorick.....	1890
Sullivan, John Patrick.....	1909
Thomas, John Benjamin.....	1906
Waltz, George Harry.....	1914
Walz, Jacob Lee.....	1906
Ware, Charles Howard.....	1898
Werckshagen, Otto.....	1907
Westcott, James Walling, Ph.G..	1890
Whittle, William Aloysius.....	1908
Wich, Henry Edward.....	1909
Williams, Lawrence Soper.....	1910
WINKELMANN, JOHN HENRY....	1864
Wolf, Charles Augustus.....	1906
Wolf, James Carlton.....	1905
Wolf, Michael Francis.....	1906

*Catonsville.*

Simon, William.....	1885
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*Chestertown.*

Toulson, Milbourne Asbury, Ph.G.....	1905
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*Cumberland.*

Holtzmann, Charles Hanson....	1911
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*Easton.*

Stam, Donald Ferguson.....	1910
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*Fort Washington.*

Simmons, Fred. S.....	1911
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*Frederick.*

Keller, Jacob Heisely.....	1911
Pearre, Albert Lindsay.....	1906

*Frostburg.*

Pearce, George Ellsworth.....	1911
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*Hagerstown.*

Meredith, Harry Lionel.....	1900
Schindel, David P.....	1914

*Relay, Baltimore Co.*

Hindes, Joseph Frey.....	1910
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*Roland Park.*

Morgan, Charles.....	1899
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*Salisbury.*

White, Edward Riall.....	1911
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## MARYLAND MASSACHUSETTS

*Snow Hill.*

Powell, William Cottingham. . . 1895

*Sykesville.*

Swain, Robert Lee. . . . . 1909

*Taneytown.*

 McKinney, Robert Sentman,  
Ph.G. . . . . 1898

## MASSACHUSETTS.

*Beverly.*

Delaney, Thomas F. . . . . 1910

*Boston.*

Ackerman, Adolf Henry, Phar.D. 1910

 BASSETT, CHARLES HARRISON,  
Ph.G. . . . . 1867

Bigelow, Edward Fisher. . . . . 1912

Blake, Harry Wilmarth. . . . . 1909

Bradley, Theodore James. . . . . 1896

Burleigh, Edwin Porter. . . . . 1911

Burnham, Alfred Augustus, Jr. 1891

Burroughs, Geo. Lawrence, Ph.G. 1910

Cabitt, Harry. . . . . 1909

Carter, Fred. Louis. . . . . 1905

Carter, Frederick Louis, Jr. . . . . 1912

Charron, Roy Chester. . . . . 1915

Cooney, Jas. H. . . . . 1914

Correa, John Francis, Jr. . . . . 1914

Daniell, Walter Harold. . . . . 1915

Doliber, Franklin W. . . . . 1914

DRURY, LINUS DANA, Ph.G. . . . . 1871

Epstein, Herman Jacob. . . . . 1914

Finneran, James Francis. . . . . 1906

Geddes, Lillian M. . . . . 1912

 GODDING, JOHN GRANVILLE,  
Ph.G. . . . . 1875

Godwin, Howard. . . . . 1910

Griffin, Lyman Whiting. . . . . 1907

Hunt, Reid. . . . . 1904

Lyons, Michael Francis. . . . . 1910

McIntire, Martin J. . . . . 1910

Monnier, Ernest. . . . . 1913

Muldoon, Hugh Cornelius, Ph.G. 1913

O'Brien, James M. . . . . 1910

PIERCE, WILLIAM HERBERT. . . . . 1879

Sawyer, John R. . . . . 1908

 SHARPLESS, STEPHEN PASCHALL,  
S.B. . . . . 1875

## SHEPPARD, SAMUEL ARUS DAR-

LINGTON. . . . . 1865

Shurtleff, Frank Hamilton. . . . . 1914

 Smith, Howard Harry, Ph.G.,  
M.D. . . . . 1911

Stachli, Theodore Hermann. . . . . 1912

Tapley, Francis Herbert. . . . . 1914

Thompson, Leon Albert, Phar.D. 1907

Tobin, John J. . . . . 1914

Troupin, Eli Salmon. . . . . 1914

Vargas, Heredia Jorge. . . . . 1891

West, Charles Alfred. . . . . 1892

Wiffin, Harry Carleton. . . . . 1910

Williams, George Gorham. . . . . 1888

Wooten, Thomas Victor, Ph.G. 1893

*Brookline.*

Clapp, Lowell Tuckerman. . . . . 1905

Gammon, Irving Parker. . . . . 1906

Hitchcock, Charles H. . . . . 1910

Morey, Arthur C., Ph.G. . . . . 1911

Nagle, Edward G. . . . . 1915

*Cambridge.*

Acheson, William Robert. . . . . 1910

Armstrong, Thomas Call. . . . . 1915

Ford, Charles Mangan. . . . . 1887

Hawthorne, Herman Francis. . . . . 1909

LaPierre, Elie Henry, Ph.G. . . . . 1892

McCormick, Peter Joseph. . . . . 1909

Norton, George Edward. . . . . 1895

Stover, Charles Albert, Ph.G. . . . . 1909

*Chelmsford.*

BAILEY, FREDERICK. . . . . 1869

*Chicopee.*

Dalton, Ernest. . . . . 1913

*Clinton.*

Burdette, Bernard Clarence. . . . . 1911

*Dorchester.*

Archer, Frederick. . . . . 1913

Connelly, Frederick Wm., Ph.G. 1907

*Dorchester Center.*

Coleman, George Edward. . . . . 1912

Kelley, Gustavus A. . . . . 1910

Houston, Peter S. . . . . 1914

Tripp, Arthur Horton. . . . . 1906

Saunders, Wm. H., Ph.C. . . . . 1910

Trumpold, Emil H. . . . . 1914

## MASSACHUSETTS.

*East Boston.*

Bemis, Robt. Edson..... 1914  
 Packard, Charles Herbert..... 1906  
 Woodbury, Frank Allen..... 1910

*East Saugus.*

Stacey, John Edward..... 1914

*Everett.*

Ayers, John R., Jr..... 1914  
 Wagner, Arthur Carl..... 1907

*Fall River.*

Brunelle, Albert Joseph..... 1910  
 Corrigan, Dominick F..... 1912

*Gardner.*

Carroll, Geo. J..... 1914

*Gloucester.*

Barker, Fred A..... 1914

*Grafton.*

Webster, Duane Earle..... 1915

*Greenfield.*

Walsh, John Francis..... 1914

*Groton.*

Bruce, Harry Llewellyn..... 1910

*Holyoke.*

Heinritz, Lebrecht Gustav..... 1902

*Hudson.*

Toohey, Matthew Frederick..... 1911  
 Wheeler, Carlton Bancroft,  
 Pharm.D..... 1907

*Jamaica Plain.*

Lewis, Ernest Grant..... 1892  
 Smith, Linville Holton..... 1892

*Lawrence.*

Call, Harry Burrett..... 1909  
 Glover, William Henry, Ph.G.... 1891

*Leonminster.*

Nixon, Charles Frederick, Ph.G. 1900

*Lowell.*

Donoghue, Richard Sheridan.... 1910  
 HOOD, CHARLES IRA..... 1871  
 Willson, George Arnold..... 1906

*Ludlow.*

Booth, Albert Edward, Ph.G.... 1907

*Lynn.*

De Coster, Harry Wilson..... 1913

*Malden.*

Buckley, D. Frank..... 1914

*Marlboro.*

Barnard, Harry Ames, Ph.G.... 1907

*Melrose.*

Briry, William S., Ph.G..... 1911  
 Ripley, Henry Milton..... 1910

*New Bedford.*

Fonteyne, G. J..... 1912  
 Mackler, Max..... 1913  
 SHURTLEFF, ISRAEL HAMMOND 1875

*Newburyport.*

Davis, Charles Leland, Ph.G.... 1897

*Newton.*

Hudson, Arthur..... 1882  
 WILSON, BENJAMIN OSGOOD.... 1859

*Newton Center.*

Hahn, William..... 1910

*Newton Highlands.*

Waterhouse, Joseph Thomas.... 1910

*North Cambridge.*

Olive, George M..... 1911

*Norwood.*

Brooks, Frederick Pratt..... 1914

*Pittsfield.*

Ingstrom, Ernst Oscar, Ph.G... 1906

*Plymouth.*

Cooper, James W..... 1909

*Rosindale.*

Wicker, Judson A..... 1911

*Roxbury.*

Hoey, Charles Edward..... 1913

*Sagamore.*

Adams, James Holmes..... 1906

*Saugus.*

Whitaker, William Henry..... 1910

## MASSACHUSETTS—MICHIGAN.

*Shelburne Falls.*

BAKER, EDWIN..... 1875

*Somerville.*

Grover, George Elmer..... 1910

Perry, Henry William..... 1910

*Southborough.*

Newton, Robert Albrow..... 1906

*Southbridge.*

Hartwell, Geo. H..... 1914

*Springfield.*

Leonard, Edward Fenno..... 1909

Lerche, Albert..... 1913

*Stoneham.*

Emerson, Herman Lincoln..... 1911

PATCH, EDGAR LEONARD, Ph.G. 1872

*Taunton.*

Crossman, George A..... 1872

*Uxbridge.*

Gunn, Horace E..... 1914

*Waltham.*

Gleason, Patrick Sebastian..... 1904

Hudson, John Robert..... 1910

*Watertown.*

Pendleton, Clarence Isaac..... 1915

*Waverly.*

Burdette, Bernard Clarence..... 1911

*Wellesley.*

Fitzpatrick, Patrick Joseph..... 1908

*West Medford.*

Shedd, Edwin Walter..... 1910

*West Roxbury.*

Sumner, Jennie Henrietta, Ph.G. 1909

*Weymouth.*

Regan, John Perley..... 1915

*Winchester.*

 Knight, Frank Herbert, A.B.,  
Ph.G..... 1909

*Winthrop.*

Stover, Wm. Francis..... 1914

*Wollaston.*

Hurlbert, William Alexander. 1909

*Worcester.*

Brewer, Howard Dickinson... 1902

Flint, William S..... 1909

Guerin, James Francis..... 1898

## MICHIGAN.

*Ann Arbor.*

EBERBACH, OTTMAR..... 1869

Glover, Clifford C..... 1913

Schlotterbeck, Julius O..... 1888

STEVENS, ALVISO BURDETTE... 1885

*Battle Creek.*

Goodale, Martin H..... 1910

*Coldwater.*

Lyon, Arthur George.... 1909

*Detroit.*

Allen, Wm. H..... 1914

Averyt, Henry Madison..... 1907

Bertram, E. O..... 1915

Blome, Walter H..... 1915

Bodimer, Roy E..... 1914

Bogart, Frank E..... 1915

Boldt, A. Herbert..... 1915

Bowen, Harvey S..... 1914

Bradt, Frederick T..... 1915

Breitenbach, Alfred P..... 1914

Briggs, Clifton Henry..... 1914

Casey, Jas. P., M.D..... 1914

Chantler, Arthur E..... 1914

Chase, Walter M..... 1915

Crane, Geo. W..... 1914

De Yonckherre, John Fadalius.. 1915

Doty, Wirt P..... 1914

Douglas, Mathew H..... 1914

Doyle, Geo. E..... 1915

Drugoncin, Nicholas..... 1915

Elliott, George J..... 1913

Evans, Wm. C..... 1915

Farwell, Oliver Atkins..... 1912

Fiero, Wm. W..... 1914

Francis, John Miller, B.S., M.A. 1906

Frasier, Everett I..... 1914

Gorenflo, Oscar William..... 1909

Graber, Howard T..... 1915

Grommet, Geo. H..... 1915

## MICHIGAN.

Grunow, Oliver H.....	1914	Taylor, Francis Owen, Ph.C.....	1912
Hall, William Alanson.....	1888	Thompson, Frank Augustus, Ph.C.....	1908
Hamilton, Herbert C., Chemical Engineer.....	1912	Turnbull, Walter J.....	1914
Hayward, Lawrence Barnes.....	1912	Van Vleet, M.....	1915
Helfman, Joseph.....	1894	Vernor, James.....	1866
Hirth, Paul H.....	1915	Von Koss, Joseph J.....	1913
Houghton, Elijah Mark, Ph.C., M.D.....	1889	Wait, C. Raymond.....	1914
Hugill, R. E.....	1915	Weaver, Clarence Albert.....	1909
Ingram, Frederick Fremont, Jr.	1914	Webster, John Hugh, Ph.G.....	1911
Ivanoff, Petko Lazaroff.....	1913	Wheeler, Albert Alton.....	1906
Jackman, Wilbur F.....	1899	Young, Andrew P.....	1914
Jones, Ernest Ray.....	1915	<i>Erie.</i>	
Jones, Nathaniel H.....	1914	Moyer, A. E.....	1913
Joyce, James H.....	1914	<i>Flushing.</i>	
Killingsworth, Clarence L.....	1914	Sprague, Wesson Gage.....	1895
Kimmich, Ernest.....	1914	<i>Grand Rapids.</i>	
Kinsel, E. C.....	1914	Jongejan, Cornelius Henry.....	1910
Kolbe, Emil B.....	1914	Kirchgessner, William Carl, Ph.C.	1903
Lakey, Roland Treiber.....	1914	Macdonald, Horace R.....	1910
Leacock, Walter Gordon.....	1914	Remus, Wm. J.....	1914
LYONS, ALBERT BROWN.....	1885	Vellema, Peter.....	1915
Mallard, Albert E.....	1907	<i>Grandville.</i>	
Mann, Charles Frederick.....	1903	Thomas, Clyde L.....	1914
Mason, Harry Beckwith.....	1896	<i>Hersey.</i>	
Mitschkun, Mark D.....	1915	Delzel, J. T.....	1915
Nelson, Edwin Horatio.....	1904	<i>Highland Park.</i>	
OHLIGER, LOUIS PHILIP.....	1871	French, Adelbert P.....	1915
Ohliger, Willard.....	1903	<i>Holly.</i>	
Perrin, D. Edmund.....	1915	Atkinson, Lawrence.....	1915
Perry, Frederick William Riley, Ph.C.....	1885	<i>Ionia.</i>	
Pinkerton, Howard.....	1914	Gundrum, George.....	1882
Pinkerton, M. E. (Mrs.).....	1914	<i>Iron Mountain.</i>	
Potts, C. H.....	1914	Seibert, George Frederick.....	1909
Ramsey, Clarence F.....	1914	<i>Jackson.</i>	
Reid, Alexander.....	1914	Foote, C. E.....	1915
Rennie, Robert W.....	1914	Kramer, J.....	1915
Riestein, Albert G.....	1915	Thome, Edgar R., Ph.D.....	1913
Rohnert, Frederick.....	1915	<i>Kalamazoo.</i>	
Ryan, Frank Gibbs.....	1892	Light, S. Rudolph.....	1914
Schaupner, John Philip.....	1915	Todd, Albert May.....	1885
Schettler, Geo. M.....	1914	<i>Lansing.</i>	
Scoville, Wilbur Lincoln.....	1891	Shannon, Fern L.....	1910
Seltzer, Leonard Adams, Ph.C...	1899	Todd, Abel Robert.....	1914
Starwalt, Ellis Jayson.....	1915		
Stevens, Grant W.....	1910		
Stewart, J. A.....	1915		
Strawn, Miss May.....	1912		



## MICHIGAN—MINNESOTA—MISSISSIPPI.

<i>Leland.</i>	Stuart, (Mrs.) Josephine A.
Lederle, Archibald L..... 1913	Wanous..... 1897
<i>Manton.</i>	Sweet, William Herbert..... 1905
Seeley, Milton J..... 1914	Thompson, Albert Delano..... 1895
<i>Muskegon.</i>	Tupper, Edward A..... 1914
Koon, Chas. S..... 1915	Wulling, Frederick John, Ph.G.
<i>Pontiac.</i>	L.L.B..... 1893
Leisenring, Willis..... 1909	<i>Ortonsville.</i>
<i>Port Huron.</i>	Nielson, John..... 1897
Rodgers, Edward James..... 1909	<i>Pipestone.</i>
<i>Saginaw.</i>	Menzel, Max..... 1915
Heim, Henry..... 1900	<i>St. Paul.</i>
MINNESOTA.	Bartleson, Rasmus..... 1915
<i>Alexandria.</i>	Bollinger, Clifford H..... 1912
Holverson, Henry T..... 1909	Collier, William Kelly..... 1897
<i>Duluth.</i>	Conger, Frederick Albert..... 1907
Abbott, William Allen..... 1901	Frost, William Arthur, Ph.G.... 1892
<i>East Grand Forks.</i>	Heller, Chas. T..... 1906
Kingman, Ignatius..... 1914	Jelinek, John Peter..... 1907
<i>Fergus Falls.</i>	Johnson, Hans Martin..... 1915
Beise, John Henry..... 1908	McCall, Henry..... 1910
<i>Hopkins.</i>	Messing, Richard J..... 1913
Smetana, William S..... 1915	Noyes, Charles Reinold, B.A.... 1908
<i>Lindstrom.</i>	Parker, Frederick M..... 1902
Elfstrand, Wilhelm..... 1905	Rietzke, Herman W..... 1909
<i>Minneapolis.</i>	Smith, Frederick Alfred Upsher,
Allen, E. Floyd..... 1885	Ph.C..... 1907
Bachman, Gustav..... 1905	Vennemann, P. Heinrich, Sergt.
Butters, Charles Hayes..... 1907	1st Cl. H. C., U. S. A..... 1912
Danek, John Francis..... 1895	<i>West Duluth.</i>
Erkel, Arthur George, Ph.C.... 1910	Lindgren, A. Julius..... 1915
Gamble, Stewart..... 1897	<i>Winona.</i>
Griffen, Truman..... 1909	Leeb, Theodore Feargod..... 1903
Harrah, John William..... 1910	<i>Worthington.</i>
Haynes, Manley Hewitt..... 1912	Morland, Robert Lawson..... 1909
Huhn, Charles Hugo, Ph.C.... 1905	MISSISSIPPI.
King, George Alexander Newton 1892	<i>Aberdeen, Monroe Co.</i>
Kulp, George Henry..... 1910	Eckford, Joseph William..... 1883
Newcomb, Edwin Leigh, P.D.... 1906	<i>Biloxi.</i>
Robitshek, Irving H..... 1914	Stier, Carl, Ph.G..... 1902
	<i>Jackson.</i>
	McGee, James Clyde..... 1915
	<i>Leakesville.</i>
	Anding, C. E..... 1914

## MISSISSIPPI—MISSOURI.

<i>Meridian.</i>		Whitney, David Victory, Ph.G. . . . .		1903
Kendall, Gus C. . . . .	1913	Whitney, Minnie M. (Mrs.) . . . . .		1914
<i>Port Gibson.</i>		Wirthman, John George . . . . .		1903
Shreve, John Alexander . . . . .	1880	Wirthman, Joseph Charles . . . . .		1903
<i>University.</i>		Zinn, Charles Edward . . . . .		1909
Faser, Henry Minor . . . . .	1910	<i>Kirksville.</i>		
<i>Water Valley.</i>		Stookey, H. Frank . . . . .		1914
Flake, William Lee . . . . .	1914	<i>Mexico, Andrian Co.</i>		
MISSOURI.		Llewellyn, Henry D. . . . .		1915
<i>Bonne Terre.</i>		LLEWELLYN, JOHN FREDERICK . . . . .		1867
Pirtle, Virgil Earl . . . . .	1915	<i>Nevado.</i>		
<i>Boonville.</i>		Ballagh, Wilfred Thomas . . . . .		1901
Mittelbach, William, Ph.G. . . . .	1891	Wardin, Ralph Lincoln, Ph.G. . . . .		1913
<i>Brunswick.</i>		<i>New Madrid.</i>		
Bowen, Cyrus West, B.S., M.S., M.D., Ph.G. . . . .	1912	Hummel, John Andrew . . . . .		1901
<i>Canton.</i>		<i>St. Joseph.</i>		
Linn, Junius Blanton . . . . .	1915	Bender, Walter Comstock . . . . .		1909
<i>Cape Girardeau.</i>		Burvenich, Anton . . . . .		1909
Miller, Edwin Alexander, B.Pd., Ph.G. . . . .	1912	<i>St. Louis.</i>		
Miller, Isaiah Benjamin . . . . .	1912	Ambler, Jessie H. . . . .		1914
<i>Craig.</i>		Bade, William J. F. . . . .		1914
Cox, Edwin G. . . . .	1914	Batdorf, Lydia Franke . . . . .		1915
<i>East Prairie.</i>		Bentz, Hampton H. . . . .		1914
Doyle, Robert A. . . . .	1914	Biermann, Chas. Harry . . . . .		1914
Hawkins, John M. . . . .	1915	Blakeslee, Louis George . . . . .		1903
<i>Higginsville.</i>		BOEHM, SOLOMON . . . . .		1871
Koppenbrink, Jesse Edmund . . . . .	1913	Brewer, Justin Sewall . . . . .		1912
<i>Jefferson Barracks.</i>		Buckland, Thomas A. . . . .		1914
Wickett, Francis William . . . . .	1911	Burkart, George Adrian . . . . .		1915
<i>Kansas City.</i>		Buehler, Carl Theodore . . . . .		1910
Amos, Wilbur Stanton . . . . .	1908	Caspari, Charles Edward . . . . .		1902
Clark, Charles B. . . . .	1915	Claus, Otto Ferdinand, M.D. . . . .		1901
Crampton, Ferd. Leslie . . . . .	1896	Cloughly, Orval James . . . . .		1913
Federmann, William Martin . . . . .	1901	Collins, George William . . . . .		1911
Hess, Paul Ludwig . . . . .	1892	Coussens, Bettie Prince . . . . .		1910
Lee, Richard Henry . . . . .	1904	Emery, Charles Wm., Jr. . . . .		1914
		Falk, John Charles . . . . .		1900
		Fricke, Frederick Henry . . . . .		1901
		Gerding, Elmer G. . . . .		1914
		Gietner, Charles, Ph.G. . . . .		1905
		GOOD, JAMES MICHENER . . . . .		1871
		Goodale, P. L. . . . .		1915
		Grewe, Louis Frederick, Ph.G. . . . .		1901
		Griesedieck, Bernard H. . . . .		1914
		Gunn, Wm. J. . . . .		1914
		Hagee, William Price . . . . .		1901

MISSOURI-MONTANA.

Hageman, Theodore Chas.....	1915	Speckart, Otto N.....	1914
Hagenow, Theodore Frederick...	1901	Stolle, Henry Jasper.....	1903
Hahn, Charles Wm. John Henry	1901	Stuart, Francis Joseph.....	1913
Haines, Frank Allen, Ph.G., Ph.C.	1911	Sultan, Frederick William.....	1901
Hammett, Frank U.....	1914	Suppan, Leo Richard August....	1904
Hemm, Francis.....	1881	Uhlich, Ferdinand Gottlieb.....	1881
Hickey, William Alexander.....	1912	Veillon, Louis, M.D.....	1915
Hoester, Julius C.....	1914	VORDICK, AUGUST HENRY.....	1874
Horton, Charles Henry, Phar.D.	1905	Walbridge, Cyrus Packard.....	1901
Huffman, Bertha Grace.....	1911	Wall, Otto Augustus.....	1884
Ilhardt, William Kellerman.....	1901	Waller, Olva L.....	1914
Ittner, William Frederick.....	1903	WHELPLEY, HENRY MILTON,	
Kahre, William Frederick.....	1913	Ph.G., M.D.....	1887
Koch, Albert H.....	1914	Wiedemann, Hugo E.....	1914
Koehler, Arthur Glenn.....	1914	Wilkerson, Jerome Aloysius....	1911
KLIE, GEORGE HENRY CHARLES,		Willette, Sidney Burke.....	1913
Ph.G., M.D.....	1878	Williams, N. Emery, Ph.G.....	1912
Kring, Gustave.....	1912	Wolff, Edward Henry.....	1901
Kurtz, Irwin William.....	1904	Wolff, Frederick W.....	1914
Lambert, Alert Bond.....	1914		
Lane, Frank Eugene, Jr.....	1915	<i>Sedalia.</i>	
Lang, George, Jr.....	1909	Bard, William E.....	1901
Lehmann, Louis John.....	1911	SMITH, OTIS WILMER.....	1903
Lieberstein, Jacob.....	1913		
Lieberstein, Louis, Ph.G.....	1909	<i>Springfield.</i>	
Lusk, Earl R.....	1914	Trantham, Isham A.....	1914
Mackelden, John William.....	1911		
MALLINCKRODT, EDWARD.....	1869	<i>Warrensburg.</i>	
Martin, Albert John.....	1915	Robinson, Kenneth Nye.....	1915
Merrell, George Robert.....	1901		
Merrell, Hubert Spencer, Jr.,		<i>Webster Grove, St. Louis Co.</i>	
Ph.B., Ph.C.....	1910	Mueller, Ambrose.....	1894
Meyer, Theodore Frederick.....	1901		
Noll, Martin James.....	1898	<i>Windsor, Henry Co.</i>	
Parker, Claude H.....	1915	Wesner, Henry Clay.....	1901
Pauley, Alfred Washington.....	1914		
PAULEY, FRANK CHARLES.....	1879	MONTANA.	
Rehfeld, Gustav.....	1914	<i>Belgrade.</i>	
Rose, Ernest W.....	1914	Porter, W. P.....	1915
Ruf, Frank A.....	1913		
Sanger, John A.....	1914	<i>Billings.</i>	
Schiess, Benedict Frederick....	1914	Chapple, Charles J.....	1915
Schlueter, Robert Ernst, Ph.G.,			
M.D.....	1904	<i>Bogeman.</i>	
Schoenthaler, John Paul.....	1901	Kraker, John Lewis.....	1912
Schwerdtmann, Theodore Robert	1913		
Seitz, Lorenz Aloysius.....	1901	<i>Butte.</i>	
Sennewald, Emil August.....	1900	Dreibellis, Louis.....	1915
Sizemore, Clarence R.....	1911	Jensen, Carroll A. B.....	1914
Smith, Paul W.....	1912	Montgomery, W. R.....	1915
		Rockefeller, Howard.....	1900
		<i>Gardiner.</i>	
		Hauptman, David H.....	1914

## MONTANA—NEBRASKA—NEVADA.

<i>Great Falls.</i>		<i>Kenesaw.</i>	
Woehner, Frederick A.....	1909	Mikkelson, Niels.....	1903
<i>Kalispell.</i>		<i>Lincoln.</i>	
Bromme, William Louis, Ph.G....	1907	Day, Elsie.....	1915
<i>Livingston.</i>		Haschenburger, Edmund Ommen,	
Connell, Roy L.....	1914	Ph.G.....	1907
Scheuber, Frank Augustus.....	1905	Lyman, Rufus Ashley, A.B.,	
<i>Missoula.</i>		A.M., M.D.....	1908
Bateman, Herbert Howard.....	1909	Perusse, Francis Joseph.....	1915
Coffee, Sidney J.....	1909	<i>McCook.</i>	
Mollett, Charles Edwin Francis,		McConnell, Lewis William, Ph.G.	1904
Ph.C.....	1909	<i>Oconto.</i>	
Peterson, Alex F.....	1914	Jones, Orel, Ph.G.....	1911
NEBRASKA.		<i>Omaha.</i>	
<i>Arlington.</i>		Arledge, I. Curtis.....	1914
Weber, Don Caesar.....	1908	Cermak, Emil.....	1908
<i>Auburn.</i>		Gerald, Herbert Franklin.....	1906
Dort, Edward Harvey.....	1903	Gering, Henry R.....	1907
<i>Ceresco.</i>		Green, James Harvey.....	1912
Lincoln, Clarence Shelp.....	1914	McEwen, Irving.....	1914
<i>Creston.</i>		Myers, Preston Brown.....	1897
Ewing, Samuel E.....	1913	Newton, Howard Chamberlain..	1912
<i>Crofton.</i>		Piel, Warner A.....	1912
Cass, Orbia Wilson.....	1914	Sherman, Charles Rollin.....	1889
<i>Daykin.</i>		Yates, Edward T.....	1912
Christian, Robert J.....	1911	<i>Overton.</i>	
<i>Decatur.</i>		Hoye, Daniel J.....	1911
Byram, Henry Earle.....	1914	<i>Plattsmouth.</i>	
<i>Fairbury.</i>		Fricke, Frederick George.....	1903
Pease, Autumn Vine.....	1893	<i>Spencer.</i>	
<i>Fort Robinson.</i>		Harper, J. Earle.....	1913
Weir, Samuel A.....	1911	<i>Stratton.</i>	
<i>Herman.</i>		Dame, Ray David.....	1915
Bell, David W.....	1914	<i>Tekamah.</i>	
<i>Holbrook.</i>		Hemping, Harry.....	1914
Butler, Guy.....	1909	NEVADA.	
<i>Holdrege.</i>		<i>Elko.</i>	
Fink, Daniel Jacob.....	1903	Englert, William Robert.....	1915
		Taber, Joseph Mark.....	1912



## NEW HAMPSHIRE--NEW JERSEY.

## NEW HAMPSHIRE.

*Berlin.*

Lyford, Earl, Howard, B.A.,  
Ph.C..... 1903

*Manchester.*

Knowlton, George Harry..... 1907

*Nashua.*

Rice, Herbert Eugene..... 1910

*Plymouth.*

Currier, Harold S..... 1915

*Portsmouth.*

Grace, William Day..... 1896  
Green, Benjamin..... 1888

*Somersworth.*

Hurd, John Charles..... 1892

## NEW JERSEY.

*Bayonne.*

Dodge, Francis Despard..... 1910

*Bloomfield.*

Wood, James H..... 1914

*Bridgeton.*

Dare, Charles Ford..... 1889  
Jorden, Henry Albert, Ph.G..... 1902

*Burlington.*

Sparks, Edgar Reed, Ph.G..... 1909

*Camden.*

Barrett, Charles Llewellyn..... 1902  
Beringer, George Mahlon..... 1893  
Beringer, George Mahlon, Jr.,  
P.D..... 1905  
Butcher, Chas. M., Ph.G..... 1915  
Reiser, Philip..... 1913  
Weiser, William Peiffer..... 1902

*Collingswood.*

Vanderkleed, Charles Edwin.... 1902

*East Orange.*

Dahl, Fred..... 1913  
Hart, William Frank..... 1912  
Lamar, William Robinson..... 1901

*Elizabeth.*

Jacobson, Samuel M..... 1915  
Langheinze, Louis A..... 1915  
OLIVER, WILLIAM MURRAY..... 1875  
Schmidt, Henry..... 1904  
Stutzlen, Frank Charles..... 1902  
Thum, George Ernst..... 1915

*Fort Hancock.*

Hahn, Gustave, Sgt. 1st Cl.  
H. C., U. S. A..... 1912

*Frenchtown.*

Harman, Harry M..... 1909

*Glen Ridge.*

Doolittle, Roscoe Edward..... 1909

*Hackensack.*

McFadden, Eugene A..... 1915

*Haddonfield.*

King, James David..... 1910

*Hoboken.*

Hostmann, Jeannot..... 1912  
KLUSSMANN, HERMANN..... 1876  
Mitschele, Albert H..... 1915

*Ironia.*

Coleman, John H..... 1902

*Jersey City.*

Foulke, James..... 1881  
Fried, Leopold H..... 1914  
Gallagher, John Charles..... 1893  
Hines, L. C..... 1915  
North, Herman Harold..... 1915  
Thumser, Louis F..... 1915

*Jersey City Heights.*

Bongartz, Ferdinand Alphonse... 1905  
Deuble, John, Ph.D..... 1915

*Kearney.*

Shaak, Franklin Philip..... 1906

*Keyport.*

Warn, William Edgar..... 1886

*Linden.*

Kraemer, William Charles..... 1914

*Maplewood.*

Byrnes, Garrett..... 1913

## NEW JERSEY.

*Medford.*

THORN, HENRY PRICKETT, Ph.G. 1879

*Milburn.*

Campbell, George S. 1914

*Montclair.*

Blake, John Henry 1915

Wensch, Henry Ernst, Jr., Ph.G. 1902

*Morristown.*

CARRELL, EUGENE AYRES. 1875

*Mount Holly.*

Dubell, Alexander 1914

Jones, Edward B. 1909

*Newark.*

Bear, Pierce B. 1905

Crooks, Harry W. 1915

Foster, John Benjamin 1901

Friedman, Isaac 1915

HOLZHAUER, CHARLES. 1873

Holzhauer, Charles William, A.B.,

Phar.G., Phar.D. 1907

Maltbie, Birdsey Lucius 1912

Marquier, Adolph F., Ph.G. 1909

Menk, Charles William 1898

Olshin, Meyer David 1915

Rusby, Henry Hurd 1890

Scholz, Oscar Robert Bruno 1909

Strauss, David 1910

Stutzlen, Harry A. 1914

*New Brunswick.*

KILMER, FREDERICK BARNETT. 1886

*Ocean City.*

Gilbert, Cyrus Thurston 1913

*Ocean Grove.*

Woolley, Stephen Disbrow 1915

*Orange.*

Behrens, John Frederick 1908

SAYRE, EDWARD AUGUSTUS. 1877

*Passaic.*

Klar, Morris L., Ph.G. 1915

*Paterson.*

McNeill, William Henry 1912

*Penn Grove.*

Johnson, Areta B. 1915

*Perth Amboy.*

Frankel, Lewis 1915

Parisen, George Warren 1892

Seaman, Frederick Anthony 1905

*Plainfield.*

Armstrong, T. S., Ph.G. 1912

*Rahway.*

Frame, A. W. 1914

Murray, Benjamin Lindley,

Ph.C., B.S., A.M. 1896

*Red Bank.*

Van Derveer, Robert Hutchinson 1903

*South Orange.*

Feindt, Louis E. 1906

*Spring Lake.*

Culbreth, David Marvel Reynolds 1883

*Tenafly.*

Bower, Edwin Lawrence 1909

*Trenton.*

Forman, Leroy 1913

Randolph, Raymond Bernard

Fitz 1912

*Union Hill.*

Bischoff, H. E. 1915

*Verona, Essex Co.*

Rich, William Pitt 1902

*Vineland.*

Lowe, Clement Belton, Ph.B.,

Ph.G., M.D. 1895

*Weehawken.*

Frank, August, Ph.G. 1912

*West Hoboken.*

Maggio, James Innocenzo 1907

Neu, Daniel Alfred 1903

Sieker, Ferdinand August 1893

*Westfield.*

Frutchey, George Watson 1909

*Woodbridge.*

Drake, Charles 1915

## NEW MEXICO -NEW YORK.

## NEW MEXICO.

*Albuquerque.*

Ruppe, Bernard Charles ..... 1908

*East Las Vegas.*

Murphey, E. G. .... 1909

*Socorro.*

Hilton, Emily K. (Mrs.) ..... 1913

*Tucumcari.*

Wilson, Lucius Lamar ..... 1915

## NEW YORK.

*Albany.*

Bradt, Warren Lansing ..... 1903

Dillennbach, Garrett Van der Veer ..... 1902

Hutman, Edward C. .... 1915

Lange, Wm. Maurice ..... 1914

Michaelis, Gustavus, Ph.G. .... 1882

 Taylor, Henry Lewis, A.B.,  
A.M., Ph.D. .... 1906

*Alexandria Bay.*

Zoller, Glenn M. .... 1914

*Auburn.*

Adams, Arthur Ellison ..... 1902

Bower, Stratton Valley ..... 1914

Sears, Charles Barager ..... 1906

*Avon.*

Lucas, Frank K. .... 1915

*Binghampton.*

Downes, Frank L. .... 1915

*Bronx.*

Allard, Herman Joseph ..... 1914

*Bronxville.*

Smith, William Humphrey, Ph.G. .... 1912

*Brooklyn.*

 Anderson, William Christine,  
Ph.G., Phar.D. .... 1900

Bank, Edward A. .... 1914

Bartley, Elias Hudson ..... 1893

Cantor, Lorentz, Ph.G. .... 1907

Caruso, Joseph ..... 1914

Coblentz, Virgil ..... 1882

Creagan, William Thomas ..... 1912

DeJonge, Cornelius ..... 1899

DeMattia, Michele ..... 1915

Dewender, William Henry ..... 1896

Diehl, August ..... 1909

Diekman, Clara Ada ..... 1912

Dissosway, Thurston N., Ph.C. .... 1905

Duerr, George John ..... 1910

DUNN, JOHN AUGUSTUS ..... 1867

Eccles, Robert Gibson, M.D. .... 1885

 FOUGERA, EDMUND CHARLES  
HENRY ..... 1890

Frye, William E. .... 1913

Gardner, Alexander, Ph.G. .... 1910

Glancy, John Douglas ..... 1913

Hall, George C. .... 1914

Heimerzheim, Eugene ..... 1914

Hereth, Frank Samuel ..... 1893

Holmes, Ralph Cerele ..... 1912

Lohness, Archie Percival ..... 1913

Marianowsky, Jacob ..... 1915

 McELHENIE, THOMAS DEARM-  
OND, Ph.G. .... 1872

Millikin, Joseph Pancoast ..... 1914

Rabinowitz, Wm. Joseph ..... 1915

Raubenheimer, Otto, Ph.G. .... 1902

Read, Harry A. .... 1915

Rehfuß, Jacob H. .... 1913

Robinson, Saul M. .... 1914

Rosenzweig, Benjamin ..... 1898

Schaak, Milton Franklin ..... 1906

Schwartz, Israel ..... 1914

Snyder, Ambrose Chancellor ..... 1867

Tocco, Orazio ..... 1910

Turner, Joseph L. .... 1914

 Tuthill, Frederick Percival,  
Ph.G., Phar.D. .... 1899

Westheimer, David ..... 1912

Wyckoff, Elmer Ellsworth ..... 1906

Yaffa, David Benjamin ..... 1913

*Buffalo.*

Bentz, Henry George ..... 1904

Dimond, Harry John ..... 1904

 Gregory, Willis George, M.D.,  
Ph.G. .... 1886

Handy, John Abner ..... 1914

Hayes, Horace Phillips ..... 1880

Lock, Frank E. .... 1910

Lockie, Peter M. .... 1911

Menzies, John William ..... 1911

Morgan, Richard Franklin ..... 1914

Polonsky, Evel ..... 1914

## NEW YORK.

Reimann, George.....	1902	<i>Governor's Island.</i>	
Roehrig, Albert Michael, Ph.G..	1902	Robertson, David, Sgt. 1st Cl. H.	
Ryer, Jos. S.....	1915	C., U. S. A.....	1912
Stoddart, Thomas.....	1900	<i>Hudson.</i>	
Washburn, Madison, W. ....	1915	POWER, FREDERICK BELDING....	1872
Whelan, William Farrar.....	1911	Wardle, Arthur Stanley.....	1910
<i>Cambridge.</i>		<i>Kenmore.</i>	
Richardson, Frank, Ph.G.....	1906	Annis, Helen Perle.....	1915
<i>Catskill.</i>		<i>Kingston.</i>	
DuBois, William Laneman.....	1880	Dedrick, William Frederick.....	1914
<i>City Island.</i>		McBride, Charles Luther.....	1910
Alpers, Otto C.....	1913	<i>Little Falls.</i>	
<i>College Point.</i>		Hurley, John.....	1909
Hartz, Johann Daniel August...	1902	<i>Middletown.</i>	
Klein, Edward Nicholas Emil,		Rogers, Fred Schwartz.....	1914
Ph.C.....	1905	ROGERS, WILLIAM HENRY.....	1869
Meyer, Samuel.....	1914	<i>Monticello.</i>	
<i>Corning.</i>		Isakovics, Alois von.....	1905
Cole, Victor Le Roy.....	1880	<i>Mount Vernon.</i>	
<i>Dannemora.</i>		Horstmann, Gustave.....	1914
Sloss, Robert Audley.....	1901	Stone, Clarence George, Ph.C...	1901
<i>Delmar.</i>		<i>New Lebanon.</i>	
HUESTED, ALFRED BIRCH.....	1879	Cox, J. Harry.....	1914
<i>Dunkirk.</i>		<i>New York.</i>	
Davis, Eugene Miller.....	1892	Allison, William O.....	1895
<i>Ellis Island.</i>		Alt, Frederick F.....	1914
Macdowell, William Foster.....	1904	Altman, Jos.....	1914
<i>Elmhurst, L. I.</i>		Arny, Harry V., Ph.G., Ph.D...	1891
Roon, Leo.....	1913	Ballard, Charles William, Ph.C.,	
<i>Elmira.</i>		Phar.D., M.A.....	1908
HOLMES, CLAYTON WOOD.....	1873	BALSER, GUSTAVUS.....	1875
<i>Flushing.</i>		Beilstein, Christian.....	1907
HEPBURN, JOHN.....	1873	Berger, Louis, Ph.G.....	1907
<i>Fort Michie.</i>		Bernard, Pierre Arnold.....	1914
Lienhart, Adolph H.....	1913	Bigelow, Clarence Otis.....	1900
<i>Ft. Niagara.</i>		Bilhuber, Ernst.....	1912
Duignan, John.....	1914	Bockar, John J.....	1915
<i>Fort Slocum.</i>		Boeddiker, Otto.....	1895
Baum, Fred C.....	1911	Brickelmaier, Paul H.....	1913
		CHANDLER, CHARLES FREDERIC..	1867
		Churgin, Joseph S.....	1914
		Cohen, Herman, Ph.D.....	1915
		Colle, Bernard.....	1911
		Cone, Alfred I.....	1905



## NEW YORK.

Conyngham, William Boulton...	1909	Levine, Victor Emanuel.....	1915
Costelo, David.....	1915	Liebemann, Elia.....	1915
Crockett, Wm. G.....	1914	Lovis, Henry Christian.....	1892
Currens, Turner Fee.....	1914	Luft, George W.....	1913
Daggett, Volvey Chapin.....	1901	Lurie, James.....	1914
Darling, Joshua Ferris.....	1909	MAIN, THOMAS FRANCIS, Ph.G.	1872
Diekman, George Charles.....	1898	Maisel, Joseph.....	1908
Diner, Jacob, Ph.G.....	1906	Major, Alphonse.....	1913
Erhart, William Hermann.....	1907	Mansfield, William.....	1907
Euler, C. G.....	1913	Mayer, Joseph L.....	1905
FAIRCHILD, BENJAMIN THOMAS.	1875	Mayo, Caswell Armstrong.....	1893
Fairchild, Samuel William.....	1887	McCartney, Frank Leslie, Phar. D.	1907
Fajardo, Gabriel J.....	1915	McINTYRE, EWEN, JR.....	1903
Feinberg, Meyer A., Ph.D.....	1915	McKesson, Donald, B.A.....	1906
Ferguson, George Albert, B.P....	1905	McKesson, George Clinton.....	1888
FRASER, HORATIO NELSON, Ph.G.,		McKESSON, JOHN, JR.....	1867
PH.M., M.D.....	1888	Metz, Herman A.....	1910
Friedgen, Charles.....	1915	Meyer, Gustave H.....	1915
Gane, Eustace Harold.....	1895	Miller, Abraham N., Ph.D.....	1915
Gay, St. Claire Ransford (Mrs.)	1914	Myerson, Isaac Aaron.....	1906
Geisler, Joseph Frank.....	1889	Nevin, Thomas.....	1912
Githens, Thomas Stotesbury....	1909	Oats, Henry Edward.....	1911
Godlust, Oscar M.....	1915	Oefele, Baron Felix von.....	1912
Gordon, Eugene.....	1915	O'NEIL, HENRY MAURICE.....	1879
Greenbaum, Soloman.....	1915	Oxman, Herman Harrion, Ph.G..	1915
Hamann, William Augustus.....	1907	Pickhardt, Elsa Grace (Miss)....	1913
Harris, Harry L.....	1913	Pierson, Romaine.....	1913
Hatcher, Robert Anthony.....	1905	Plaut, Albert.....	1894
HAYNES, DAVID OLIPHANT.....	1887	Putt, Earl B.....	1914
Heddesheimer, William G.....	1915	Quackenbush, Benjamin Franklin	1886
Henning, Adolph.....	1905	Riefflin, George T.....	1909
Hohmann, George.....	1910	Rippetoe, John Ross, P.D.....	1907
Holliday, Francis Emlen.....	1900	Roediger, Louis Frank, Ph.G....	1909
Hopkins, Jesse L.....	1898	RUNYON, EDWARD WHELOCK...	1875
Jacobsohn, Joseph.....	1915	Sahm, Louis Napoleon.....	1905
Jones, James H.....	1915	Saphiro, Isadora.....	1914
Kalish, Oscar G., Ph.G.....	1900	Schenck, Henry.....	1903
Kantor, Morris, Ph.G.....	1912	Schieffelin, William Jay.....	1892
Kantrowitz, Hugo.....	1907	Schimpf, Henry William.....	1894
Kemp, Edward.....	1903	Schlicke, Carl Paul.....	1913
KENNEDY, EZRA JOSEPH.....	1887	Schmidt, Maurice Roland.....	1914
Kirchgasser, Wm. Charles, Ph.G.	1888	Schnell, Harry Julius.....	1906
Kleinau, George.....	1911	Shnitter, Adolf, Ph.G.....	1914
Klingmann, Albert.....	1910	Schweinfurth, George Edward...	1907
Klingmann, Otto.....	1913	Scott, Harry.....	1907
Koch, William Julius.....	1907	Sher, Edward.....	1911
Lampa, Robert Raymond.....	1892	Smith, Carl Edw.....	1911
Lascoff, Jacob Leon.....	1903	Spring, George Alexander.....	1907
Latham, Thomas.....	1907	Takamine, Jokichi.....	1898
Lehman, Robert Seel.....	1910	Taylor, Wm.....	1914

## NEW YORK—NORTH CAROLINA.

Timmermann, Richard Herman..	1909
Tucker, Thomas H.....	1912
Velsor, Joseph A.....	1913
Vorisek, Anton.....	1915
Weil, Jacob.....	1913
Weinstein, Joseph, P.D., Pro- visor Imp. Univ. Moscow, Russia.....	1905
Weiss, Emil Otto.....	1907
WICKHAM, WILLIAM HULL.....	1870
Wimmer, Curt Paul.....	1907
Woolsey, Jesse Francis.....	1910
Wooyenka, Keizo.....	1907
Zeluff, Irwin Simpson.....	1915

*Niagara Falls.*

Ulrich, Richard J.....	1914
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*Norwich.*

Hunt, Frank Louis.....	1915
Stofer, Richard C.....	1914
Windloph, J. Fred.....	1913

*Queens, L. I.*

Niece, Frederick Ellwood, Ph.G., Phar.D., Chem.Gd.....	1903
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*Richmond Hill, L. I.*

Bloch, Jacob Maurice.....	1915
Gardner, Robert J.....	1915
Stephenson, John Joseph.....	1905

*Rochester.*

Hyde, Byron M.....	1908
Maines, Eugene L.....	1912
Smith, J. Hungerford.....	1913
Snider, Hilton F.....	1915
Stevenson, Wm. P.....	1915
Strasenburgh, John Harold.....	1915

*Salamanca.*

Krieger, John Christian.....	1908
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*Saratoga Springs.*

Cramer, Louis.....	1914
Fish, Charles Frederick.....	1866

*Sayville.*

Thornhill, Sewell.....	1909
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*Schenectady.*

Kirschberg, Bradley Henry.....	1914
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*Sheepshead Bay.*

McMahon, Joseph.....	1897
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*Springfield, L. I.*

De Forest, William Pendleton....	1879
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*Stapleton, Staten Island.*

Stearns, William Lincoln, Ph.G..	1903
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*Syracuse.*

Cummings, Wm. Leon.....	1914
DAWSON, EDWARD SEYMOUR, JR.	1876
Muench, Albert August.....	1914
Muench, William.....	1899
SNOW, CHARLES WESLEY.....	1876
Stolz, David.....	1911

*Tottenville.*

Lehman, Charles Norton.....	1909
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*Utica.*

Slauson, John Gordon.....	1907
Watson, William, Jr.....	1902

*White Plains.*

Roemer, John, O.P.....	1910
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*Whitestone.*

O'Rourke, Francis Jos.....	1914
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*Yonkers.*

Petsche, Franz, Friedrich Bis- marck Wilhelm.....	1892
Schlesinger, Leopold Joseph.....	1912

## NORTH CAROLINA.

*Andrews.*

Davis, Hamilton Ewart.....	1915
Howard, James D., Ph.G.....	1914

*Bryson City.*

Bennett, Kelly Edwin.....	1933
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*Chapel Hill.*

Beard, John Groves.....	1914
Howell, Edward Vernon.....	1900

*Charlotte.*

Stowe, James Pinkey.....	1914
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*China Grove.*

Swaringen, DeWitt Clinton....	1905
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*Fayetteville.*

Horne, Warren Winslow, Ph.C.	1902
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## NORTH CAROLINA—NORTH DAKOTA—OHIO.

*Goldsboro.*

Hicks, John Elias Faison..... 1910

*Lumberton.*

McDonald, John Stedman..... 1914

*Marion.*

Penick, S. Barksdale..... 1914

*Morgantown.*

Greyer, Charles Peyton..... 1912

*Oxford.*

Hays, Francis Banks..... 1902

*Rocky Mount.*

Rose, Ira Winfield, Ph.G..... 1912

*Tarboro.*

ZOELLER, EDWARD VICTOR..... 1878

*Tryon.*

Missildine, Ernest Ellwood, A.B. 1910

*Wilmington.*

Hardin, John Hapwood..... 1881

*Wilson.*

Tarkenton, Edward Lawrence... 1912

## NORTH DAKOTA.

*Agricultural College.*

Schlichting, Arthur Floyd..... 1913

*Bismarck.*

Finney, Burt..... 1909

*Fargo.*

Bentson, Bernard Leo..... 1909

Porterfield, Wm. Perry, Ph.G... 1909

Norman, John E..... 1914

*Grafton.*

Haussamen, Henry Louis, Ph.G. 1906

*Rugby.*

Miller, John Sidney..... 1914

*Willow City.*

Master, Walter..... 1909

## OHIO.

*Ada.*

 Mohler, David Christian, Ph.G.,  
Ph.L..... 1906

*Akron.*

Davis, Ernest C., Ph.C..... 1913

*Arcanum.*

Hoffmann, Charles O..... 1913

*Athens.*

Cotner, Henry W..... 1914

*Barnesville.*

Ely, Ernest Sykes..... 1904

*Beach City.*

Goudy, Earl Edw..... 1914

*Bellevue.*

Brinker, John Henry..... 1906

*Bluffton.*

Hauenstein, Sidney..... 1913

*Bucyrus.*

Johnston, Ralph R..... 1915

*Canton.*

Portmann, Leo Edward..... 1912

*Chillicothe.*

Howson, Arthur Bagshawe..... 1886

*Cincinnati.*

Albrecht, P. Gerhard..... 1915

Apmeyer, Charles Ascau..... 1906

Blumenthal, Isadore F..... 1914

Cain, Frank B., M.D..... 1914

De Courcy, Lydia..... 1913

De Lang, Alfred..... 1915

Fack, Rudolph..... 1913

 Fennel, Charles Theo. P., Ph.G.,  
Phar.D..... 1886

 Freericks, Frank Herman, Ph.G.,  
LL.B..... 1905

Greyer, Julius..... 1880

Harding, Charles F..... 1913

Heinemann, Edwin..... 1913

Heister, Louis..... 1914

Jones, Harold W..... 1913

Katz, Otto..... 1904

Kohl, J. Otto..... 1913

Kotte, Fred S..... 1913

Lakamp, William..... 1913

Lammert, Cyrus J..... 1914

LLOYD, JOHN URI..... 1870

Merrell, Charles George, S.B.... 1888

Minster-Ketter, Frederick John.. 1913

Meulberg, Victor Charles..... 1915

Murphy, Dennis E..... 1914

Otis, John C..... 1913

## OHIO.

Ott, Bertha (Miss).....	1913
Southard, Frank Allen, Ph.G....	1903
Thiesing, Edward Henry.....	1912
Voss, Edward, Jr.....	1904
Weik, John.....	1913
Weissmann, Charles.....	1914
Werner, Louis.....	1913
Wetterstroem, Caroline (Mrs.)...	1914
Wetterstroem, Theodore David..	1897
Wittkamp, Clarence T.....	1915
Zuenkeler, John Ferdinand, Ph.G.....	1887

*Circleville.*

Fickhardt, Frederick Lutz.....	1904
Powell, Fred A.....	1915

*Cleveland.*

Alpers, William Charles.....	1890
Benfield, Charles William.....	1893
Cobb, Ralph Lathrop.....	1883
Curtis, Morris E.....	1915
Feil, Joseph.....	1885
Flandermeier, August Louis, Ph.G.....	1910
Fox, Willard Milton.....	1903
Guenther, Harry F. J.....	1915
Hankey, William Tabor.....	1902
Hechler, Edward Henry.....	1904
Henge, William.....	1915
HOPP, LEWIS CHRISTOPHER.....	1876
Kepes, Joseph.....	1914
Lehr, Frank P.....	1915
Maguire, Edward Sylvester, Ph.G.....	1897
Marshall, George Gehring.....	1915
Muhlhan, Otto Emil.....	1905
Placak, Harry, Ph.G.....	1902
Rabenstein, Edward, Jr.....	1915
Rauschfleisch, Edward C.....	1915
Reed, James Garfield.....	1909
Schellentrager, Ernest August...	1906
Schmitman, Henry.....	1914
Schoenhut, Christian Henry.....	1888
Selzer, Eugene Reinhold, Ph.C...	1893
Sherwood, Henry Jackson.....	1894
Sollmann, Torald.....	1908
Sords, Thomas Vincent.....	1893
Varga, John.....	1914
Walleck, Andres E.....	1915
Winter, Carl.....	1910

*Columbus.*

Ackerman, Philip Jacob.....	1906
Aldridge, Alice (Mrs.).....	1915
Bagley, Anna Gertrude.....	1912
Blum, Otto Carl.....	1914
Braun, Carl L.....	1915
Collinson, F. J.....	1914
Dye, Clair Albert.....	1901
Ford, Myron Nile.....	1912
Hansen, Matthew Kjoss.....	1911
Harrington, Edward W.....	1913
Harrington, Frank.....	1869
Harris, Alva O.....	1915
Hatton, Ellmore Wright.....	1894
Herpich, John Le Dure.....	1906
Kauffman, George Beecher.....	1882
Kiler, Abdel Wm.....	1915
Lehman, George T.....	1915
Marckworth, Otto Stanley.....	1913
Marshall, Ernest Clifton.....	1910
McClintock, Chester W.....	1915
Paar, Albert Rheinhart.....	1915
Rinker, Oscar O.....	1915
Sauerbrun, Otto Orville.....	1905
Schueller, Frederick William....	1880
Spease, Edward, B.Sc., Ph.C.....	1912
Topping, George Ballard, Ph.C...	1913
Wagner, Jacob L.....	1915
Webb, Edward Nathan.....	1905
Wendt, William Carl.....	1901
Wilfrid, Sister Mary.....	1915
Will, Albert R.....	1915
Young, Cyrus Homer.....	1915

*Dayton.*

Jenkins, Elizabeth (Miss).....	1913
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*East Liverpool.*

Holloway, Jesse Daniel, Ph.C...	1905
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*Elyria.*

Craine, Percy P.....	1908
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*Fairport Harbor.*

Irwin, Charles H.....	1913
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*Grand Rapids, Wood Co.*

THURSTON, AZOR.....	1886
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*Hartsville.*

Wiley, Anna I. (Mrs.).....	1915
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OHIO—OKLAHOMA—OREGON.

*Mount Blanchard.*

Burnette, Clifford R..... 1914

*Norwood.*

Brittain, William Leo Broadup.. 1913

*Portsmouth.*

Amann, Frank..... 1914

*St. Mary's.*

McIntire, Charles L..... 1915

*Springfield.*

SIEGENTHALER, HARVEY NEWTON 1882

*Toledo.*

Bowman, Waldo Moffett..... 1905

Diethelm, Martin..... 1914

Loesser, Paul A..... 1915

Ludwig, William Edward..... 1904

Start, Ray C..... 1915

Ulm, Hamilton C..... 1915

Wernert, Joseph A..... 1914

*Troy.*

Tobey, Charles William, Ph.G... 1909

*Twinsburg.*

Stingel, Jacob Leroy..... 1909

*Xenia.*

Donges, Wm. H..... 1914

*Youngstown.*

Cassaday, Orlin Ulysses..... 1899

Lundgren, Ludwig Alexander,

R. S..... 1913

McAnlis, James L..... 1914

OKLAHOMA.

*Anadarko.*

Nichols, Clarence Van Buren.... 1915

*Bristow.*

Humphrey, John D..... 1915

*Guthrie.*

Lillie, Foress Ball..... 1900

*Hennessey.*

Dinkler, Frank Adam..... 1900

*Madill.*

Rollins, William Cleveland..... 1914

*Noble.*

Bradley, F. E..... 1915

*Norman.*

De Barr, Edwin..... 1905

Stocking, Charles Howard..... 1914

*Nowata.*

Brunk, L. D., Jr..... 1914

*Red Rock.*

Fraser, Charles A..... 1915

*Stroud.*

Burton, John Clement..... 1902

*Weatherford.*

Hudelson, F. H..... 1914

*Wynnewood.*

Shackelford, Hilary S..... 1915

OREGON.

*Albany.*

Woodworth, D. Olin..... 1914

*Coquille.*

Fuhrman, Cyrus Jacob..... 1915

*Corvallis.*

Zieffe, Adolph..... 1910

*Grants Pass.*

Sabin, George C..... 1914

Slover, James Anderson..... 1909

*Marshfield.*

Brown, James Lee, Ph.G..... 1903

*North Bend.*

Everitt, Miles Ellsworth..... 1909

*Portland.*

Byerley, Fabian..... 1900

Chapman, Thomas A..... 1914

Clarke, Louis Gaylord..... 1900

Gradon, Walter Allen..... 1900

Haack, Ludolph George..... 1900

Kochler, William Francis..... 1900

Laue, John Max Alfred..... 1904

McKellips, Clarence..... 1900

McMillan, Daniel Newcomb,

Ph.G..... 1909

## OREGON—PENNSYLVANIA.

<i>Silverton.</i>		<i>Du Bois.</i>	
Johnson, Lewis.....	1909	Hay, Charles La Mar.....	1898
<i>The Dalles.</i>		Simmons, Joseph A.....	1913
Blakeley, George Clarence.....	1892	<i>Easton.</i>	
<i>Tillamook.</i>		Anspach, Paul Bucher, Ph.G....	1903
Clough, Charles Isaac.....	1915	Schlabach, Cyrus L.....	1914
PENNSYLVANIA.		<i>Eddystone, Delaware Co.</i>	
<i>Altoona.</i>		MORRIS, LEMUEL IOWORTH.....	1880
Simpson, William Monroe.....	1914	<i>Elizabeth.</i>	
<i>Ambler.</i>		Houck, David Lee.....	1909
Mattison, Richard V., M.D.....	1913	<i>Elwood City.</i>	
<i>Ambridge.</i>		Kaetzel, Charles P.....	1915
Freyemark, Geo. Fred.....	1913	<i>Elkins Park.</i>	
<i>Ardmore.</i>		Osborne, Melmoth Mercer.....	1906
Graver, Kittie H. (Mrs.), Phar.D.	1905	<i>Frankfort Arsenal.</i>	
<i>Avalon.</i>		Howson, Wm. Scott.....	1914
Young, Harry Garfield.....	1913	<i>Greencastle.</i>	
<i>Braddock.</i>		Carl, Charles Blair.....	1910
Bumbera, Joseph Edward.....	1913	<i>Grove City.</i>	
Czyzewski, Blasius Joseph.....	1909	De France, George W.....	1910
Kutscher, George William.....	1905	<i>Harrisburg.</i>	
Marsh, Harold.....	1915	GEORGE, CHARLES THEODORE...	1873
Reichert, Louis, Jr.....	1910	Goodyear, Wilbur B.....	1915
<i>Bryn Mawr.</i>		GORGAS, GEORGE ALBERT.....	1884
Winslow, Edward Fayssoux.....	1910	Kramer, Charles F.....	1910
<i>Carlisle.</i>		Smith, Benjamin Franklin.....	1892
HORN, WILBUR FISK.....	1876	<i>Hastings.</i>	
<i>Carrick.</i>		Easley, Joseph J.....	1915
McNulty, James Cleland.....	1909	<i>Hatboro.</i>	
<i>Castle Shannon.</i>		Rothwell, Walter.....	1907
Doyle, Joseph Jesse.....	1909	<i>Haverford.</i>	
<i>Calasauqua.</i>		Harbaugh, Wilson Linn.....	1896
LaWall, Edgar S.....	1914	<i>Houtzdale.</i>	
<i>Coal Dale.</i>		Arnold, Wm. Charles.....	1908
Hoffman, John Irwin.....	1914	<i>Huntingdon.</i>	
<i>Columbia.</i>		Wolff, Daniel Oliver.....	1909
Zeamer, Harry Wisler.....	1905	<i>Irwin.</i>	
		Cope, Roy Thomas.....	1915
		<i>Johnstown.</i>	
		Griffith, Charles.....	1900

## PENNSYLVANIA.

*Kingston.*

Lohmann, John..... 1904  
 Pegg, Harry Wilson, Ph.G..... 1908

*Kittanning.*

Sturgeon, Walter J..... 1914

*Lancaster.*

Frailey, William Otterbein..... 1903

*Latrobe.*

Drach, Chas. Dixon..... 1915

*Lebanon.*

LEMBERGER, JOSEPH LYON, PH.G.,  
 PH.M..... 1858

*Lewistown.*

Burns, Helen Ritz..... 1915

*Lock Haven.*

Heffner, Edgar F..... 1911

*Manheim, Lancaster Co.*

Ruhl, Harry Fry..... 1902

*McKeesport.*

Kuenzig, Peter A..... 1913

*McKees Rocks.*

Sandles, Van Amburg..... 1909

*Meadville.*

Utech, P. Henry, Ph.G..... 1907

*Monessen.*

Kirk, William Palmer..... 1913

*New Castle.*

Burckart, William Edward..... 1914  
 Wallace, John Crawford, Phar.D. 1905

*Norristown.*

Worthington, John Warren  
 Wolfe..... 1912

*Norwood.*

Borneman, John A..... 1913

*Ogontz.*

Clayton, Abram Theophilus..... 1906

*Oil City.*

Gaddess, John..... 1908

*Philadelphia.*

Apple, Franklin Muhlenberg,  
 Ph.G., Phar.D..... 1905  
 Bacon, Gilbert C..... 1915  
 Baer, Jacob Michael..... 1902  
 Becker, Maxwell M..... 1915  
 Blackwood, Russell Thorn..... 1907  
 Blair, Henry Cowan..... 1907  
 BORING, EDWIN MCCURDY..... 1867  
 Brewer, James Edward..... 1915  
 Brinton, Clement Starr..... 1907  
 Busch, Henry Paul..... 1910  
 Busch, Miers..... 1903  
 Cadmus, Robert Clark..... 1906  
 Cahan, Samuel..... 1915  
 Campbell, Milton..... 1902  
 Campbell, Theodore..... 1902  
 Cliffe, William Lincoln..... 1898  
 Cook, E. Fullerton, P.D..... 1901  
 Cope, Edward Kreidler..... 1914  
 Cope, Frank Henry..... 1909  
 Cuthbert, William Richard..... 1906  
 Dean, J. Atlee..... 1914  
 Decker, Robert William..... 1907  
 Eberly, Russell N..... 1914  
 England, Joseph Winters..... 1893  
 Evans, George Bryan..... 1902  
 Ferguson, James A..... 1913  
 Fischelis, Robert Phillip, Ph.G.,  
 Ph.C., B.Sc..... 1911  
 FOX, PETER PAUL..... 1869  
 French, Harry Banks..... 1890  
 French, Howard Barclay..... 1906  
 Gano, William Hubbell, Ph.G.... 1892  
 Garvey, James Aloysius, P.D.... 1909  
 Gordon, Frederick Troup, B.S.,  
 Ph.C..... 1911  
 Graham, Willard..... 1902  
 Hall, Wm. Daniel..... 1915  
 Hance, Anthony Miskey..... 1902  
 Harbold, Curtis Alexander..... 1907  
 Hassinger, Samuel Ellphat Reed 1880  
 Haussmann, Frederick William... 1895  
 Haydock, Susannah Garrigues... 1905  
 Heim, William Joseph..... 1902  
 Heintzelman, Joseph Augustus... 1858  
 Henry, Samuel Clements..... 1909  
 Hess, John L..... 1915  
 Hessler, Elmer H..... 1914  
 Hinski, Hermon Leon..... 1915

## PENNSYLVANIA.

Hoch, Quintus.....	1907	REMINGTON, JOSEPH PRICE.....	1867
Hughes, Francis Stacker.....	1902	Roberts, John Griffith.....	1914
Hummel, Joseph E.....	1914	Rohrman, Frank Randall.....	1915
Hunsberger, Ambrose.....	1905	Rosengarten, Adolph G.....	1913
Jones, Amos.....	1915	Rosengarten, Frederick.....	1913
Kahn, Solomon Karl.....	1905	Rosengarten, George David.....	1902
Kercher, Edwin Harry, Ph.G....	1907	Rosengarten, J. G.....	1913
Kirby, Charles P.....	1909	Rosin, Joseph.....	1914
Kirz, Samuel Bird.....	1907	Sadtler, Samuel Philip.....	1893
Kline, Clarence Mahlon, Ph.B...	1902	Seidman, Harry.....	1911
Klopp, Henry L.....	1913	SHOEMAKER, RICHARD MARTIN..	1865
Kohler, Charles.....	1913	Siegfried, Howard J.....	1907
KRAEMER, HENRY.....	1892	Simmel, Martin.....	1911
Lackey, Richard Henry.....	1907	Simpson, Robert.....	1913
Lantz, William Henry.....	1908	Smith, Howard E.....	1910
LaWall, Charles Herbert, Ph.M.	1896	Smith, Walter Valentine.....	1902
LaWall, Millicent Renshaw		Stanislaus, Ignatius, Valerius	
(Mrs.), P.D.....	1905	Stanley.....	1911
Lee, William Estell, Ph.G.....	1905	Staudt, Albert John.....	1907
Leedom, Charles.....	1902	Stewart, Francis Edward.....	1884
Matusow, Harry, Ph.G.....	1897	Streeper, Frank Park.....	1907
McNeary, Wm. Wilson.....	1915	Stroup, Freeman Preston, Ph.M.	1900
McNeil, Robert.....	1907	Sturmer, Julius William, Ph.G.,	
Meeker, George Herbert, B.S.,		Phar.D.....	1901
M.S., Ph.D., Phar.D., D.D.S...	1905	Thum, John Karl, Ph.G.....	1905
Mellor, Alfred.....	1864	Wallace, George R.....	1914
Merner, Paul Marcus Pfeiffer...	1915	Webb, Alvin Chester.....	1915
MILLER, ADOLPHUS WILLIAM,		WEIDMANN, CHARLES ALEXAN-	
Ph.G., M.A., Ph.D.....	1868	DER, Ph.G., M.D.....	1868
Minehart, John Roy.....	1905	Weisner, Nicholas Frederick....	1909
Moerk, Frank Xavier, Ph.G.,		White, Robert Walter, Ph.G....	1911
Ph.M.....	1898	Wood, Horatio C., Jr., M.D....	1906
Morgan, Frank E., Ph.G.,		Youngken, Dell Wallace.....	1915
Phar.D.....	1906	Youngken, Heber Wilkinson,	
Nebig, William George, Ph.G....	1907	A.B., A.M., Ph.G.....	1912
Osterlund, Otto William.....	1902	<i>Pittsburgh.</i>	
Ostrum, Hyman W.....	1914	Beucler, William George.....	1915
Pachali, Theodore, Jr.....	1907	Blumenschein, Frederick John...	1904
Peacock, Bertha Leon (Mrs.),		Burkett, K. S.....	1915
Ph.G.....	1895	Calhoun, Will M.....	1908
Peacock, Josiah Comegys, Ph.G.	1892	Campbell, Andrew.....	1909
Pearson, William Alexander....	1908	Darbaker, Leasure Kline, Ph.G.,	
Pfeiffer, Gustavus Adolphus....	1910	Phar.D.....	1909
Pittenger, Paul Stewart, Ph.G.,		EMANUEL, LOUIS.....	1878
Ph.C., Phar.D.....	1911	Gilleland, John Roy.....	1914
Poley, Warren Henry.....	1906	Glockler, B. E.....	1914
Pollard, August Torrey.....	1906	Janda, Thomas John Joseph....	1913
Reese, David J.....	1915	Judd, Albert Floyd.....	1901
Reh fuss, Charles.....	1908	Koch, Julius A.....	1892
Reif, Ernest.....	1915	Kossler, Herman Stanislaus....	1905



PENNSYLVANIA—PHILIPPINE ISLANDS.

Kretz, Edward John..... 1909  
 Lohmeyer, Henry L..... 1910  
 Michalski, John Stanislaus..... 1913  
 Mierzwa, Richard..... 1908  
 O'Brien, James Stanley..... 1912  
 Pritchard, Benjamin Elliott..... 1908  
 Rodemoyer, William Edward.... 1901  
 Saalback, Carl, Ph.G..... 1908  
 Saalbach, Louis, Ph.G., Phar.D.. 1907  
 Schaefer, Charles Henry, Ph.G.. 1909  
 Schaefer, Emil August, Phar.D.. 1900  
 Stiefel, Albert Frederick..... 1909  
 Thompson, John Reynolds..... 1905  
 Truby, Miriam Grace (Miss).... 1914  
 Walter, Peter Grant, Ph.G.,  
 Phar.D..... 1905  
 Wittmer, Robt. S. R..... 1915  
 Wurdach, John Herman..... 1909

*Pittston.*

Stroh, George D..... 1914

*Plains.*

Merritt, Henry W..... 1913

*Port Royal.*

Heckerman, Adam B..... 1915

*Pottsville.*

Deibert, Thomas Irwin..... 1882

*Reading.*

Ziegler, Howard Philip..... 1905

ZIEGLER, PHILIP MILTON..... 1867

*Rochester.*

Hamilton, Mary R. (Miss)..... 1914

*Scranton.*

Brown, Andrew..... 1915

Gardner, Howard W..... 1914

Knoepfel, William Henry..... 1909

Matthews, Charles W..... 1915

*Springdale.*

Blank, Herman Gustave..... 1905

*Towanda.*

PORTER, HENRY CARROLL..... 1872

*Warren.*

Talbott, W. A..... 1913

*Washington.*

Vowell, Louis Sweitzer..... 1905

*Wayne.*

Mulford, Henry Kendall..... 1896

*Wilkes Barre.*

Frank, Louis..... 1914

*Williamsport.*

CORNELL, EDWARD AUGUSTUS,  
 Ph.C..... 1873

Walton, Lucius Leedom, Ph.G.,  
 Ph.M., Phar.D..... 1904

*Woodlawn.*

Bryson, William Smith, Ph.C.,  
 M.D..... 1905

*Wyncote.*

Meade, Harold Barr..... 1910

*York.*

Harbold, John Tilden..... 1905

Leber, J. Gilbert..... 1905

Patton, John Franklin..... 1880

PHILIPPINE ISLANDS.

*Albay.*

Thomas, William H., Sergt. 1st  
 Cl. H. C., U. S. A..... 1912

*Bayambang.*

Elcook, William Wallace..... 1911

*Camp John Hay.*

Holt, Frank, Sgt. 1st Cl. H. C.,  
 U. S. A..... 1911

*Corregidor.*

Hare, Ralph E., Hospital Corps 1914

Joyce, Edward L., Sgt. 1st Cl. H.  
 C., U. S. A..... 1915

Nelson, Rasmus Peter..... 1914

*Fl. Mills.*

Montgomery, Moses, Sgt. 1st Cl.  
 H. C., U. S. A..... 1913

*Fort William McKinley, Rizal.*

Dickson, Robert Alexander, Sgt.  
 1st Cl. H. C., U. S. A..... 1914

Siedler, August, Sergt. 1st Cl.  
 H. C., U. S. A..... 1914

Tanney, Lewis..... 1913

## PHILIPPINE ISLANDS—RHODE ISLAND—SOUTH CAROLINA—SOUTH DAKOTA.

*Iloilo, Panay.*

Benche, Carl S. .... 1913

*Manila.*

Behre, John Rufus, Sgt. 1st Cl.

H. C., U. S. A. .... 1912

Bernhard, Magnus, Sgt. 1st Cl.

H. C., U. S. A. .... 1914

Dumez, Andrew Grover. .... 1915

Eisenman, Francis Joseph, Sgt.

1st Cl. H. C., U. S. A. .... 1912

Fancher, Wm. Q., Sgt. 1st Cl.

H. C., U. S. A. .... 1913

Guerrero, Leon Maria. .... 1904

Merryman, James R., Sergt. 1st

Cl. H. C., U. S. A. .... 1913

Murphy, William Joseph. .... 1913

Newman, Emanuel, Sergt. 1st

Cl. H. C., U. S. A. .... 1913

Schultheis, Raymond. .... 1914

Senecal, Henry C. .... 1911

Spry, Ezekiel. .... 1914

Winkler, Hugo. .... 1913

Young, Charles C., Sergt. 1st

Cl. H. C., U. S. A. .... 1912

Zamora, Manuel, Sergt. 1st Cl.

H. C., U. S. A. .... 1908

*Minandao.*

Kennedy, Robert Griffey. .... 1914

Seith, Louis F. .... 1912

Waitz, August Henry. .... 1914

*Pettit Barracks, Zamboanga.*

Steele, Irving Edward. .... 1914

## RHODE ISLAND.

*Fort Adams.*

Fender, Walter E. .... 1914

*Narragansett Pier.*

Davis, Peter Bernard. .... 1909

*Newport.*

Downing, Benjamin Franklin. .... 1886

*Pawtucket.*

Brennan, James Edward. .... 1909

Morgan, George Smith. .... 1909

*Providence.*

Anthony, Edwin Perkins. .... 1909

Blanding, William Oliver. .... 1894

Claflin, Albert Whitman. .... 1913

Colton, Edward Thomas. .... 1909

Corrigan, Michael Henry. .... 1913

Gilbert, Charles A. .... 1913

Haynes, Herbert. .... 1908

Mason, Earl Harrington. .... 1915

O'Hare, James, Phar.D. .... 1888

Parker, Gilbert Richie. .... 1910

Pearce, Howard Anthony. .... 1894

Reiner, Nicholas F. .... 1913

Shulmyer, Charles Joseph. .... 1915

Strickland, Franklin Nelson. .... 1905

## SOUTH CAROLINA.

*Charleston.*

Hyde, Joseph Bell, Jr., Ph.G. .... 1909

Plenge, Henry. .... 1910

Zeigler, Washington Hayne. .... 1915

*Dillon.*

Gaddy, Robert Litson. .... 1915

## SOUTH DAKOTA.

*Beresford.*

Kriebs, Frank Delbert, Ph.G. .... 1910

*Bonesteel.*

Kenaston, Hampton Ray (Mrs.) 1914

*Bowdle.*

Maas, Henry Conrad. .... 1910

*Brookings.*

Whitehead, Bower Thomas. .... 1908

*Centerville.*

Heisler, John Emery. .... 1910

*Conde.*

Ross, Otto Ellsworth, Ph.C. .... 1908

*Dell Rapids.*

Bent, Edward Clarence. .... 1905

*Estelline.*

Hoffelt, Edward. .... 1910

*Ft. Meade.*

Goosey, Gilbert H. .... 1913

## SOUTH DAKOTA—TENNESSEE.

*Hot Springs.*

Highley, L. E. . . . . 1913

*Huron.*

Holstrom, William A. . . . . 1913

Wheeler, John B. . . . . 1915

*Langford.*

Cook, Harry Clarence. . . . . 1912

*Lead.*

Brown, Floyd Woodford. . . . . 1910

*Lily.*

Collins, Stanley Herbert. . . . . 1915

*Mitchell.*

Scallin, Stephen Harmon. . . . . 1910

*Mobridge.*

Olson, Ferdinand P. . . . . 1910

*Parkston.*

Schnaidt, Henry J. . . . . 1915

*Redfield.*

Swartz, G. F. . . . . 1909

*Sioux Falls.*

Bernhart, Peter Kristoffer. . . . . 1910

Dunning, Lyman Taylor. . . . . 1906

*Sturgis.*

Williams, Arthur Reynolds. . . . . 1910

*Watertown.*

Jones, David Franklin. . . . . 1895

Zieske, Arthur. . . . . 1910

## TENNESSEE.

*Bolivar.*

Cook, Charles Samuel. . . . . 1912

*Chattanooga.*

Hodges, Wilbur Dexter. . . . . 1914

Voight, Joseph Frederick. . . . . 1893

*Clarksville.*

Justice, Jack Edwin. . . . . 1914

*Delherd.*

Bass, Francis Marion. . . . . 1913

*Elowah.*

McConkey, Charles Edgar. . . . . 1915

*Dyersburg.*

Jacocks, John T. . . . . 1913

Lipsecomb, W. L. . . . . 1914

*Harriman.*

Yeargan, Regan Lawrence. . . . . 1914

*Jacksboro.*

Grant, John H. . . . . 1915

*Jackson.*

Nance, Oscar Jones. . . . . 1914

*Knoxville.*

McBath, William A. . . . . 1913

Rosenthal, David Abraham. . . . . 1894

Semones, W. S. . . . . 1915

*Lawrenceburg.*

Finley, James A. . . . . 1914

*Lebanon.*

Wooten, Yandell Paul. . . . . 1914

*Lynnville.*

Waldrop, R. W. . . . . 1914

*Memphis.*

Crowe, Robert Latta. . . . . 1914

Mayo, Frederick William. . . . . 1909

ROBINSON, JAMES SCOTT. . . . . 1869

Robinson, Thomas Aubrey. . . . . 1914

Ward, Francis Watson. . . . . 1908

*Nashville.*

Bader, Charles Henry. . . . . 1914

Blodau, Gus A. . . . . 1914

Bloomstein, Max. . . . . 1910

Bradshaw, Sam Sandapher. . . . . 1914

Brumit, Juel Guilford. . . . . 1914

BURGE, JAMES OSCAR. . . . . 1878

Clark, Ira Benton. . . . . 1909

Cook, Moses. . . . . 1910

Eves, Robert Lee. . . . . 1909

Hubbard, George Whipple. . . . . 1913

Jackson, Lester N. . . . . 1914

Kleiser, Robert J. . . . . 1914

Mansfield, James Roy. . . . . 1914

McDaniel, John Rogers. . . . . 1911

McGill, John Thomas. . . . . 1900

Pully, Luther Smith. . . . . 1910

Rogoff, Julius M. . . . . 1914

Ruddiman, Edsel Alexander. . . . . 1894

## TENNESSEE—TEXAS.

Sand, Jerome Bonaparte..... 1910  
 Sloan, Earl D..... 1914  
 Smith, Frank Leslie..... 1910  
 Thompson, Robert Lee..... 1914  
 Trolinger, Ernest Franklin..... 1915  
 Wadder, Arlie L..... 1914  
 Waldrum, Jonas Y..... 1914  
 Weise, Carl E..... 1914  
 White, William Rufus..... 1904  
 Whitworth, Charles Bell..... 1914

*Newbern.*

Westbrook, Charles Gray..... 1912

*Savannah.*

Atkins, Edgar Golden..... 1914

*Sharon.*

Shannon, Thomas J..... 1905

*Shelbyville.*

Shapard, Henry Clay..... 1914

*Somerville.*

Rhea, Howard M..... 1914

*Telford.*

Brown, Frank S..... 1914

*White House.*

Covington, Robert Earl..... 1914

*Whiteville.*

Gates, William Irby..... 1913

*Winchester.*

Prince, Clofton O..... 1914

## TEXAS.

*Bomarton.*

Seydler, Robert..... 1910

*Brownsville.*

Willman, William George..... 1904

*Cooper.*

Brown, Robert Owen..... 1914

*Corsicana.*

Coolbaugh, Leonard Elsworth.... 1915

*Crockett.*

Bishop, William Penn..... 1914

*Dallas.*

Althoff, Samuel Young..... 1914  
 Anderson, Oscar Ludwig..... 1911  
 Coulson, James Thomas..... 1906  
 De Lorenzi, Albert..... 1890  
 Eberle, Eugene Gustavus, Ph.G.,  
 A.M..... 1896  
 Fletcher, J. Morgan..... 1915  
 Hawkins, Tom W..... 1912  
 Medlock, Charles Thomas..... 1911  
 Michel, Beth Angeline..... 1915  
 Mitchel, Lloyd Benjamin..... 1912  
 Schrodt, Jacob, Ph.G..... 1903

*El Paso.*

Borja, P. D..... 1915  
 Ryan, Ambrose Eugene..... 1907

*Encinal.*

Guerrero, Juan Cantu..... 1911

*Forney.*

Adams, Walter Dickson..... 1913

*Fort Sam Houston.*

Lieber, C. Jewel..... 1913  
 Stahl, Joseph, Sgt. 1st Cl. H.  
 C., U. S. A..... 1914

*Fort Worth.*

Brashear, James Preston..... 1909  
 Horn, Joe L..... 1915

*Galveston.*

Buckner, John Clark..... 1905  
 Cline, Raoul Rene Daniel, B.A.,  
 B.S., A.M., Ph.G., M.D..... 1898  
 Johnson, Robt. V., Sgt. 1st Cl.  
 H. C., U. S. A..... 1913  
 Koester, Hermann..... 1910

*Gonzales.*

Walker, Robert Hamilton, B.S.,  
 Ph.M..... 1907

*Hallettsville.*

Saccar, Michael, Ph.G..... 1905

*Houston.*

Burgheim, Jacob..... 1892  
 Gilmer, Bryant Brewster..... 1913  
 Kiesling, Adolph Ernest..... 1910



TEXAS-UTAH-VERMONT

<i>Lockhart.</i>	
Westmoreland, Edwin Reese....	1910
<i>Lubbock.</i>	
Duering, Henry Charles.....	1901
<i>Manor.</i>	
Wentland, William Henry.....	1914
<i>McKinney.</i>	
Dulaney, Joseph Field.....	1902
<i>Mt. Vernon.</i>	
Beck, Joseph Wilson.....	1914
<i>New Braunfels.</i>	
Schumann, Henry Valentine....	1911
<i>Overton.</i>	
Barksdale, Rogers Americus....	1914
<i>Palestine.</i>	
Deathe, Harry.....	1915
<i>Quanah.</i>	
Pruden, Floyd E.....	1914
<i>Rosebud.</i>	
Belson, Maynard E.....	1914
<i>San Antonio.</i>	
Chambers, Robt. T.....	1915
Dreiss, Hermann E. F.....	1912
Nester, Herman August.....	1909
Schaefer, Laura.....	1909
Whisenant, Walter Hines.....	1915
<i>San Marcos.</i>	
Shipe, Columbus A. (Miss).....	1914
<i>San Saba.</i>	
Gosch, Clarence G.....	1910
<i>Sherman.</i>	
Daily, Augustus D.....	1913
<i>Sulphur Springs.</i>	
Hyde, John D.....	1915
<i>Taylor.</i>	
Carleton, Henry Lincoln.....	1910
<i>Texas City.</i>	
Bradley, J. Luther.....	1915
Bussey, Thomas E., Sgt. 1st Cl.	
H. C., U. S. A.....	1915

Elliot, Chas. S.....	1913
Hanlon, William T.....	1915
Lewis, Walter.....	1915
Nudd, Benjamin F., Sgt. 1st Cl.	
H. C., U. S. A.....	1915
Trainer, Frank.....	1915

*Waco.*

Mason, John G.....	1911
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*Westhoff.*

Bomba, Onufry Joseph.....	1911
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*Yoakum.*

Koerth, Emil Christian.....	1919
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UTAH.

*Brigham.*

Eddy, Wynn Leland.....	1908
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*Cedar City.*

Bladen, John Mount.....	1908
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*Logan.*

Riter, Benjamin Franklin.....	1910
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*Ogden.*

Culley, John, Ph.G.....	1908
Misch, Edward Frederick.....	1910

*Salt Lake City.*

Dayton, Walter Henry, Ph.G....	1908
Harms, Herman E.....	1908
Horn, Ralph P.....	1915
Van Dyke, Charles.....	1908
Whitworth, Frank Edgar.....	1908

VERMONT.

*Barton.*

Pierce, Fred Dutton.....	1909
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*Bennington*

Gokay, William Lewis.....	1914
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*Brattleboro.*

Cox, Albert E.....	1914
Root, Wilfred F.....	1912

*Burlington.*

Beebe, Mason Gaylord...	1913
Luck, Louis H.....	1915
Zottman, William Henry..	1908

## VERMONT—VIRGINIA—WASHINGTON.

*Marshfield.*

Gilman, Elbridge Wheeler..... 1907

*Montpelier.*

Slade, Henry Allen..... 1899

*Morrisville.*

Cheney, Arthur Lewis..... 1907

*N. Ferrisburg*

Clafin, Walter Addison..... 1896

*Rutland.*

Farmer, F. E. D..... 1914

McClallen, E. Gregory..... 1912

*St. Johnsbury.*

BINGHAM, CHARLES CALVIN..... 1875

Eastman, Welcome B..... 1912

*Windsor.*

Skinner, Charles Herbert..... 1914

## VIRGINIA.

*City Point.*

Noaks, Richard Sidney..... 1911

*Culpeper.*

Goldsborough, Charles Henry... 1898

*Falls Church.*

Mankin, George Tyree..... 1909

*Fort Hunt.*

Person, Thomas..... 1911

*Fort Meyer.*

Scul, James A..... 1915

*Harrisonburg.*

Avis, James Little..... 1905

*Lynchburg.*

Fleet, Charles B..... 1909

Hamner, Edward Chambers.... 1909

Penick, Douglas McGill..... 1913

*Martinsville.*

Kearfott, Clarence Piercall..... 1908

*Norfolk.*

Arrington, Harry Seldan..... 1914

Nelligar, Frederic Dennis..... 1907

Taylor, Thomas Ramsay..... 1913

*Petersburg*

Knock, Thomas Franklin..... 1911

*Phoebus.*

Congdon, George Gardner..... 1903

*Richmond.*

Bolenbaugh, Albert..... 1909

Booker, Robert Lewis..... 1910

Brandis, Ernest Linwood..... 1906

Briggs, Andrew Gessner..... 1890

Curd, Thomas Nelson..... 1907

Echols, George Jacob..... 1914

Johann, Adam Ernest..... 1910

Lee, Chas. O..... 1915

Miller, Turner Ashby, Ph.G.... 1894

Taylor, Edgar Darby..... 1910

*Roanoke.*

Barnes, Henry Cooper..... 1905

Fox, Charles Dunsmore..... 1913

Lambert, Maud, Ph.G..... 1915

*Suffolk.*

Hall, Joseph Patten..... 1900

*Tazewell.*

Jackson, John E..... 1913

## WASHINGTON.

*Colville.*

Carroll, Burdine H..... 1914

*Connell.*Garrison, Dayton Burt, Jr.,  
Ph.G..... 1913*Doty.*

Vitous, Walter J..... 1914

*Ft. Columbia.*Paul, George Harrison, Sgt. 1st  
Cl. H. C., U. S. A..... 1914*Fort Flagler.*

Schulz, Emiel..... 1913

*Hillyard.*

Leavitt, Clarence..... 1911

*La Conner, Skagit Co.*Joergensen, Gerhard Johan Carl  
Sophus..... 1889

## WASHINGTON—WEST VIRGINIA.

<i>Pullman.</i>		<i>Buckhannon.</i>	
Maxwell, Asa Frank.....	1912	Young, George Orville, Ph.G....	1907
<i>Puyallup.</i>		<i>Clarksburg.</i>	
Truedson, Eric P.....	1904	Haymaker, Frank Berkshire....	1906
<i>Renton.</i>		<i>Glenville.</i>	
Groat, Harrison Sidney.....	1915	Tierney, James Aloysius.....	1910
<i>Seattle.</i>		<i>Harper's Ferry.</i>	
Blalock, Jesse Nelson.....	1909	Dittmeyer, Walter E., P.D.....	1907
Brown, Burton Augustus.....	1910	<i>Huntington.</i>	
Fields, James David.....	1915	Price, Walter C.....	1910
Goodrich, Forest Jackson.....	1913	<i>Iaeger.</i>	
Hindman, Frances Edith, Ph.C.,		Ray, Clifford W.....	1915
M. S.....	1915	<i>Morgantown.</i>	
Holmes, Henry Elliott.....	1880	Berry, Alonzo Brun.....	1915
Johnson, Charles Willis, Ph.C.,		Chiple, Julian Baker.....	1915
B.S., Ph.D.....	1903	Dent, Gaylord Hess.....	1915
Lamb, Earl Frederick.....	1915	Holroyd, Robert McFerrin.....	1915
Linton, Arthur Wilson.....	1910	Hutchins, Nicholas John.....	1915
McGogy, James Frank.....	1915	Melcher, George.....	1915
McLean, James Walter.....	1911	Moore, W. H.....	1915
McTague, Edward Joseph.....	1913	Ream, William Arthur.....	1915
Osseward, Cornelius, Ph.C.....	1897	Rogers, Charles Herbert.....	1914
Palmer, James Clarence.....	1915	Schultz, William Henry.....	1915
Rein, Tania.....	1910	Wood, Frank Davidson.....	1915
Rubenstein, Louis.....	1909	<i>Parkersburg.</i>	
Watson, Joseph Ryerson, Ph.C.	1904	Neptune, Campbell A.....	1915
<i>Snohomish.</i>		<i>Pine Grove.</i>	
Gilbertson, Louis Steven.....	1912	Morgan, Thomas Lee.....	1907
<i>Spokane.</i>		<i>Sutton.</i>	
McRay, Emily C.....	1915	Walker, Alfred.....	1905
<i>Tacoma.</i>		<i>Terra Alta.</i>	
Hicks, Claude Everett.....	1913	Scott, S. M., Jr.....	1914
Kent, Nick Gardner.....	1909	<i>Thurmond.</i>	
Sivear, Fred Geo., Ph.C.....	1912	Maukin, Virginia Turner (Mrs.).	1915
<i>Tenino.</i>		<i>Welch.</i>	
Battista, Angelus Andrew.....	1913	Downs, Bertis E.....	1913
<i>White Salmon.</i>		<i>Wheeling.</i>	
Tousfeldt, J. P.....	1915	Coleman, John.....	1905
<i>Wilbur.</i>		Irwin, William Wilson.....	1914
Bandy, George, Ph.G.....	1905	Davis, John C.....	1914
<b>WEST VIRGINIA.</b>			
<i>Bluefield.</i>			
Goodykoontz, Charles Henry....	1909		

## WISCONSIN—WYOMING—DOMINION OF CANADA, MANITOBA—ONTARIO.

## WISCONSIN.

*Eau Claire.*

Boberg, Otto Johan Sinius..... 1903

*Fond du Lac.*

Kremer, Berthold James..... 1913

Nooner, Thompson A..... 1914

*Jefferson.*

Fischer, Ray Otto..... 1911

*La Crosse.*

Beyschlag, Charles..... 1880

Hebberd, Edward Smith..... 1907

*Madison.*

Fischer, Richard, Ph.D..... 1901

KREMER, EDWARD, PH.G., PH.D. 1887

Langenhan, Henry August..... 1908

Lewis, Henry..... 1908

MILLER, EMERSON ROMEO..... 1895

Williams, Edward..... 1906

*Milwaukee.*

Alberts, M. Lee..... 1912

Dadd, Robert Morrow..... 1896

Eckstein, Solomon A..... 1912

Graw, Paul..... 1912

Haertlein, George Henry..... 1910

Keating, Frank..... 1914

Kettler, Edward, Jr..... 1896

Krembs, Ernest Maxmilian..... 1903

Lange, Leonard A..... 1913

Piszczeck, Theodore A..... 1913

Raeuber, Edward Gottfried,

Ph.G..... 1900

Ruenzel, Henry Gottfried..... 1892

SCHRANK, CHARLES HENRY..... 1876

Sommer, Richard Ernst Wil-

helm..... 1909

Spiegel, Adolph..... 1905

Urban, Leopold Charles..... 1912

*Niellsville.*

Sniteman, Charles Clarence..... 1881

*Oconomowoc.*

Peters, Henry August..... 1903

*Racine.*

Horlick, Alexander James..... 1904

Horlick, William..... 1913

Horlick, William, Jr..... 1913

*Reedsburg.*

Mueller, Frank F..... 1911

*Thiensville.*

Seyfert, Paul..... 1909

*Watertown.*

Eberle, Herman Theodore..... 1901

*Wausau.*

Albers, William W..... 1909

## WYOMING.

*Ft. Yellowstone (Cheyenne).*

McFarland, William..... 1914

Jensen, Albert K..... 1914

## DOMINION OF CANADA.

## MANITOBA.

*Winnipeg.*

Bletcher, Henry Ernest John.... 1904

Campbell, Charles William..... 1910

Colcleugh, Murray Chisholm.... 1913

Connell, Thomas A..... 1915

Harrison, George Waller..... 1914

Nesbitt, Evelyn..... 1910

Werner, John..... 1915

## ONTARIO.

*Guelph.*

Stewart, Alexander..... 1905

*Ottawa.*

Watters, Henry..... 1912

*Picton.*

Case, Edmund Wendell..... 1912

*Stratford.*

WAUGH, GEORGE JAMES..... 1862

*Toronto.*

Heebner, Charles Frederick..... 1894



## QUEBEC—SASKATCHEWAN—FOREIGN COUNTRIES.

## QUEBEC.

*Montreal.*

Tremble, John Edward . . . . . 1915

*St. Agathe Des Monts.*

St. Amour, Omer . . . . . 1915

*Three Rivers.*

Williams, John Lewis, Doctor

Optics . . . . . 1909

*Westmount.*

Moore, Alexander Benjamin

Journéaux . . . . . 1914

Tansey, Owen Hilary . . . . . 1915

## SASKATCHEWAN.

*Saskatoon.*

Campbell, Alexander . . . . . 1914

MEMBERS RESIDING IN FOREIGN COUNTRIES (*except Canada*).

Abreu, Gerardo Fernandez, Havana, Cuba . . . . . 1907

Adan, Francisco Varcla, Camaguey, Cuba . . . . . 1911

Alacan, Jose P., Phar.D., Havana, Cuba . . . . . 1911

Berenguer, Jose I., M.D., Santiago, Cuba . . . . . 1915

Bernstroem, Nils Gustaf, Gotenborg, Sweden . . . . . 1906

Biosca, Placido, M.D., D.Sc., Pharm.D., Havana, Cuba . . . . . 1907

Bosque, Arturo, Havana, Cuba . . . . . 1907

Cabrero, Narciso, Rabell, San-Sebastian, Porto Rico . . . . . 1915

Capote, Jose, Havana, Cuba . . . . . 1907

Carbonell, F. J., Santa Clara, Cuba . . . . . 1913

Cartaya, Julio Hernandez, Havana, Cuba . . . . . 1907

Crossley-Holland, Frank, W., F.C.S., London, England . . . . . 1914

Delgado, Joila Estrello, M.D., Province of Matanzas, Cuba . . . . . 1915

Diaz, José Guillermo, Havana, Cuba . . . . . 1907

Faundo, Eduardo Garcia, Havana, Cuba . . . . . 1915

Fernandez, Antonio Caparo'y, Havana, Cuba . . . . . 1915

Garcia, Octavia, Mannabo, P. I. . . . . 1915

Gill, L. C., Ancon, Panama . . . . . 1915

Goltz, Carl Julius, Havana, Cuba . . . . . 1915

Grimany, Frederico, Santiago de Cuba . . . . . 1912

Hallaway, Robert Railton, B.Sc., Ph.D., Carlisle, England . . . . . 1905

Herrera, Francisco, Havana, Cuba . . . . . 1907

Johnson, Manuel, Havana, Cuba . . . . . 1907

Johnson, Theodore, Havana, Cuba . . . . . 1911

Jones, José Antonio Gonzelez, Columbia, S. A. . . . . 1915

Jurado, Bolivar, Ph.C., Ph.B., Panama City, Panama . . . . . 1915

Ladakis, Triantaphylle, Beirut, Syria . . . . . 1907

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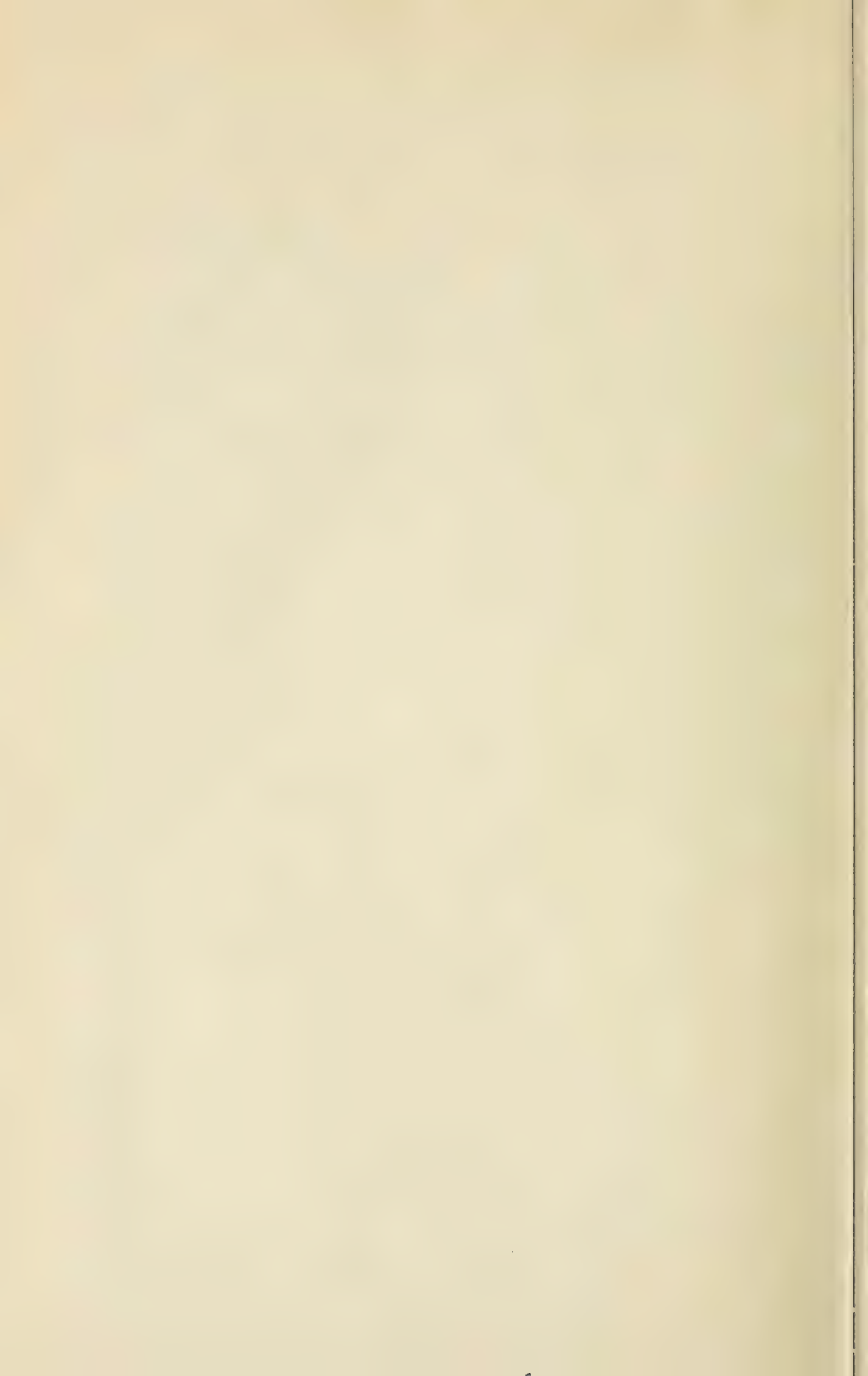
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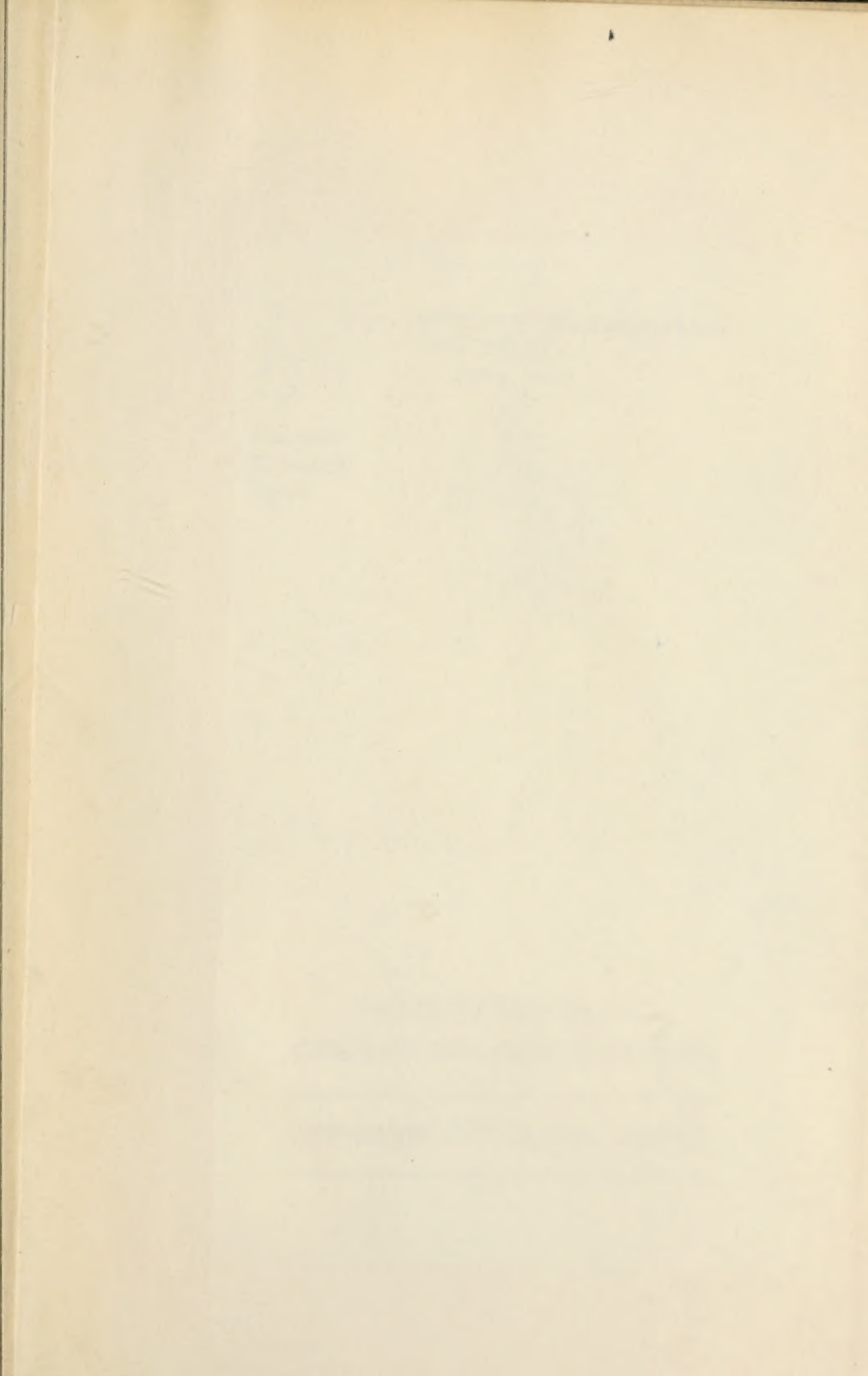
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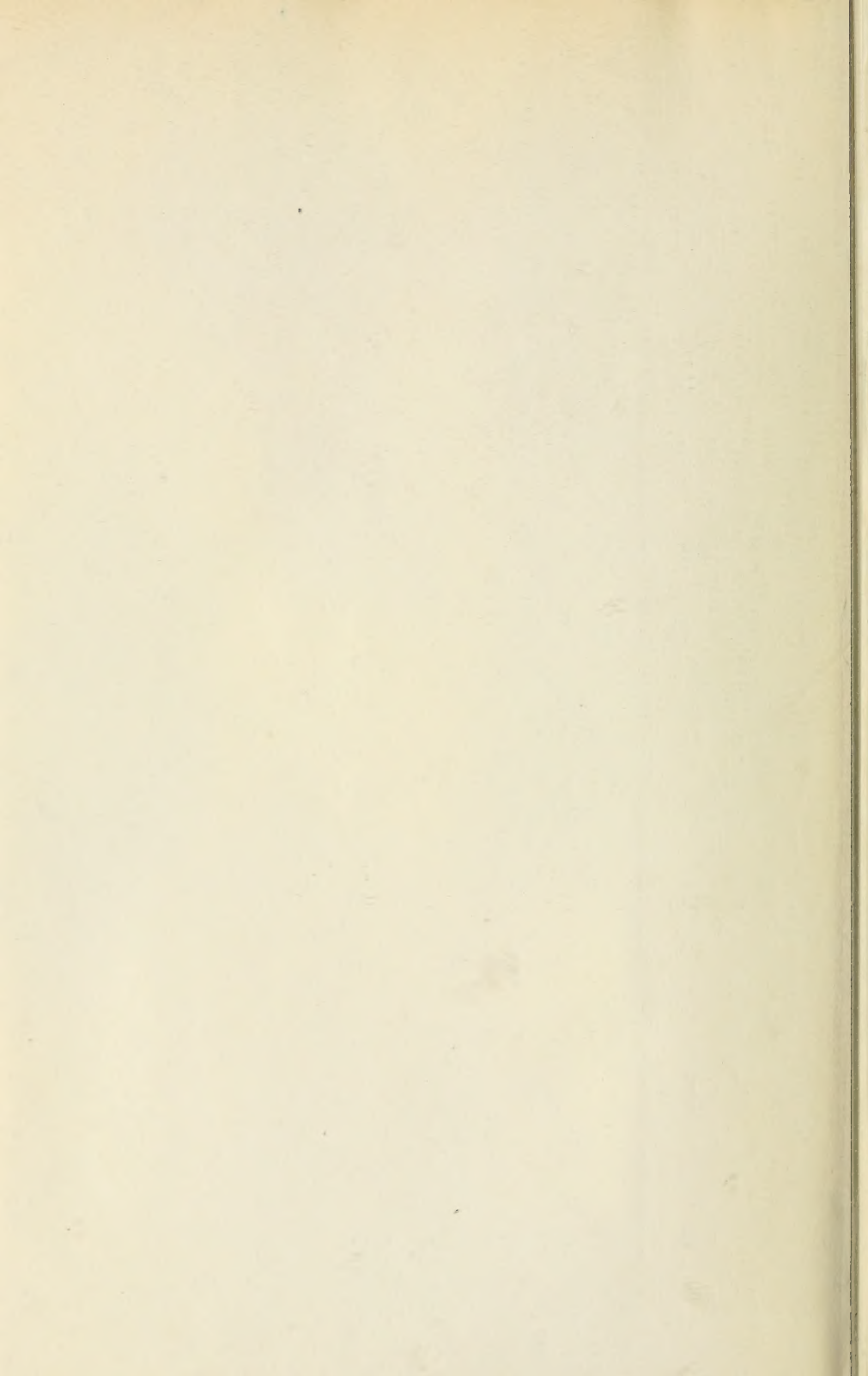
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